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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. XLVIII. NUMBER 14 | NEW YORK AND CHICAGO, OCTOBER 2, 1897. | ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

Seamless Drawn TUBING Brass and Copper to 38 in. Diam.

Randolph and Clowes

MILLS AND FACTORIES, WATERBURY, CONN.

BRANCH OFFICES: NEW YORK, ROOM 202, POSTAL TELEGRAPH BUILDING. PHILADELPHIA, PA., ROOM 320, PHILA. BANK BUILDING. CINCINNATI, OHIO, ROOM 308, NEAVE BUILDING.

WESTERN DEPOT, 226 LAKE ST. CHICAGO, ILL.

BROWN & BROS. Copper Range Boilers.

The "Gorton Side-Feed" Boilers

WILL BURN HARD OR SOFT COAL.

You Want the Best. We Have It.

SEND FOR CATALOGUE AND INVESTIGATE FOR YOURSELF.

GORTON & LIDGERWOOD CO, 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

American Seal.

Stove Putty AND Asbestos Furnace Cements

WILLIAM CONNORS, TROY, N. Y.

PARAGON HOT AIR FURNACES

SIX POINTS ~ 1·FEWEST JOINTS 2·EQUALIZED DRAFT 3·LARGEST RADIATING SURFACE 4·ABSOLUTELY SELF CLEANING 5·BALL BEARING GRATE 6·PERFECT ADAPTABILITY TO ANY KIND OF COAL

ISAAC A. SHEPPARD & CO. MANUFACTURERS PHILADELPHIA, PA. & BALTIMORE, MD.

Write for our FURNACE BOOK "HINTS ABOUT HEATING" It will interest you IT MAY HELP YOU EXCLUSIVE RIGHTS GIVEN TO ENTERPRISING DEALERS

TRADE APOLLO BEST BLOOM MARK

APOLLO GALVANIZED IRON.

No buckling—flat.
No cracking—soft.
No breaking—malleable.
No squirming—uniform.
Every sheet guaranteed.

Apollo Iron and Steel Company, Pittsburgh, Pa.

Diamond Thimbles. S. CHENEY & SON, Manlius, N. Y.

EASTWOOD VALVE.

EASTWOOD WIRE MFG. CO.. - Belleville, N. J.

AS A SPECIAL OFFER, FOR WE WILL SEND YOU $5

2 lbs. of MICA

In 8 Sizes.

¼ lb.	2 x 3½	¼ lb.	4 x 7
¼ "	2¼ x 2½	¼ "	3 x 3¼
¼ "	3 x 4¼	¼ "	2¾ x 4
¼ "	3½ x 5½	¼ "	2½ x 4½

This is sent post-paid, and includes case and a guarantee that the Mica is first quality.

Steam Specialties.

Pump Governors, Steam Traps, Steam and Water Reducing Valves, Tank Temperature Noiseless Back Pressure Valves, Water Arches, and Oil Separators. Controller.

T. KIELEY, 9-17 W. 13th St., NEW YORK

WE CLAIM THE FOLLOWING MERITS FOR JENKINS BROS.' VALVES.

1. Manufactured of the best Steam Metal.
2. No regrinding, therefore not constantly wearing out the Seat of the Valves.
3. Contain JENKINS DISC, which is suitable for all Pressures of Steam, Oil and Acids.
4. The Easiest Repaired, and all parts Interchangeable.
5. Every Valve Tested before leaving the factory.
6. ALL GENUINE stamped with Trade-Mark.

JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston

SEE THE MAGEE

advertisement on page 11 showing their new low priced range.

SEND FOR CIRCULARS.

MAGEE FURNACE CO., Boston, Mass.

Dear Dealer:—Soon after I was born, my parents, the "'Quick Meal' Gasoline and Gas Stoves," outlined what my career should be. They christened me "Quick Meal Steel Range," educated me in the school of "Merit and Success," and started me at the bottom of the ladder.

The place was terribly crowded, and my associates said there was no room for me. Some who had gone up a few Rounds came back in poverty and despair. But I determined to get to the top Round of the "Ladder of Fame," where my parents are. After going up a short distance, there was much more room, and in a little while I stood on the highest point ever reached by any Steel Range.

I am now nearly at the top Round, working for you night and day. I am going to make your Range business large, profitable and satisfactory.

Your Friend,

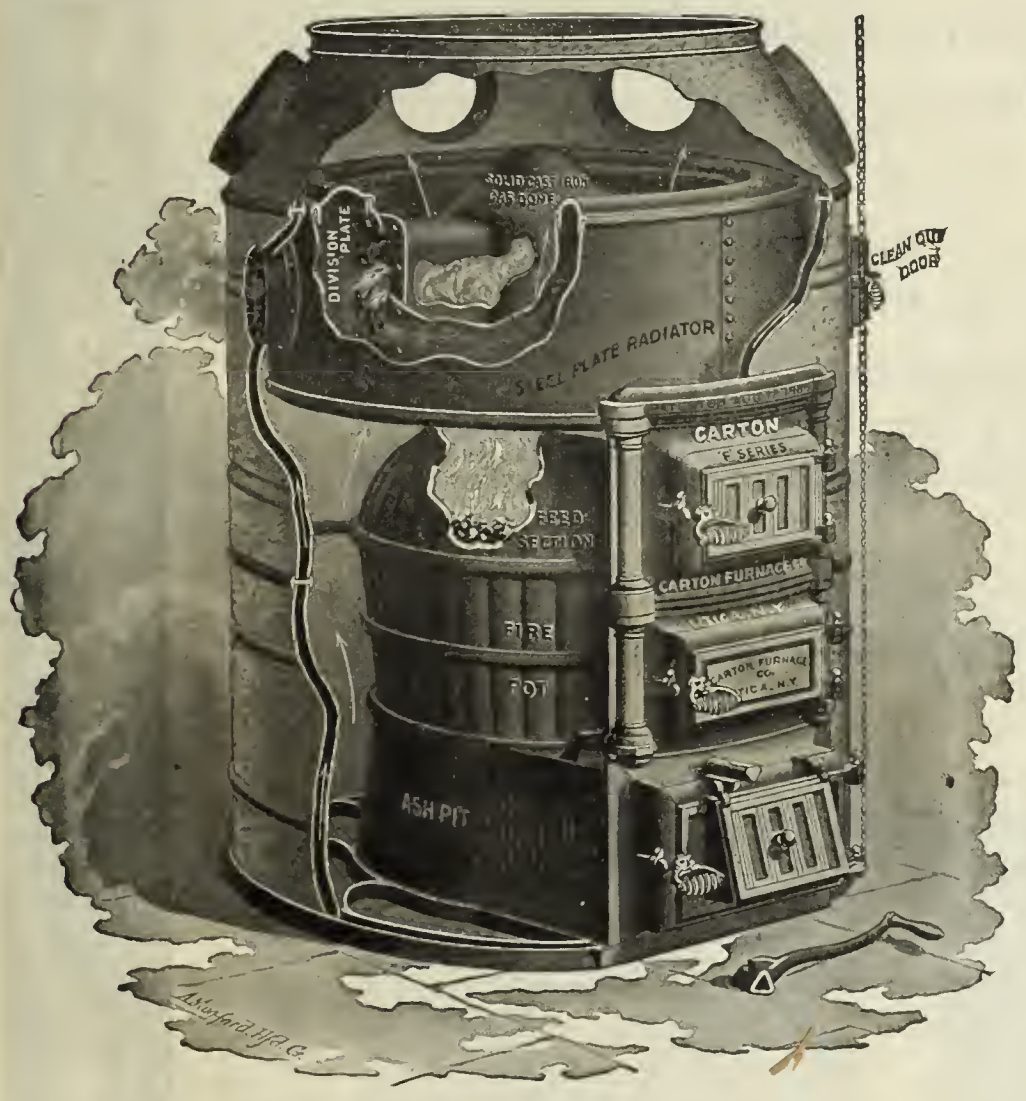
QUICK MEAL STEEL RANGE,

ST. LOUIS.

LD6.C5-
ME
V.48 2 rentle
Store

OUR NEW

Carton "F" Series.



GAS DOME

All CAST iron and large GAS MIXING Chamber.

CUP JOINT

Gas-Tight RADIATOR.

SUPERIOR construction.

ELEGANT shield FRONT.

SEND FOR OUR GOLDEN JUBILEE ANNIVERSARY FURNACE CATALOGUE===1847=1897.

If Interested in Steam and Water Boilers—we make a most complete line, and you should send for our New Boiler Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *50 Years*,

UTICA, N. Y.

ECONOMY J. F. PEASE FURNACE CO. ECONOMY

FURNACES

that are thoroughly constructed; that are well proportioned in grate and radiating surface; that have high gas burning chambers; that have straight and heavy fire pots; that have single or double piece pots; that have either flat, rocking, shaking or revolving grates; having diverted draft exits; with ratings correctly stated; that burn all kinds of good fuels; that are made in eleven patterns; that are equipped with the BEST REGULATING DEVICE ever invented. Furnaces with these and numberless other meritorious features are the apparatus we make—Trade name

...Economy...

They have a 20 year record. Our catalogue is mailed free to all dealers.

J. F. Pease Furnace Co.,

SYRACUSE, N. Y.

86 E. Lake St., Chicago.

SYRACUSE, N.Y.

Agricultural Furnace,

FARMERS' AND BUTCHERS' BOILER.

— FOR —

COAL AND WOOD.

RUSSEL WHEELER & SON
Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

SIX SIZES.

VERY LONG FIRE BOX,
REVERTIBLE FLUE
AND
ADJUSTABLE DAMPER.

An enterprising farmer can't afford to be without one. Put one on your floor and convince him the next time he comes in.

WRITE FOR CATALOGUE AND PRICE-LIST.

THE FORBES WARM AIR FURNACE.

PHILADELPHIA, April 10, 1897.

MESSRS. TUBULAR HEATING AND VENTILATING CO., 228 Quarry Street, Philadelphia.

GENTLEMEN:—The Forbes Warm-air Furnace placed in my house last fall has given me entire satisfaction.

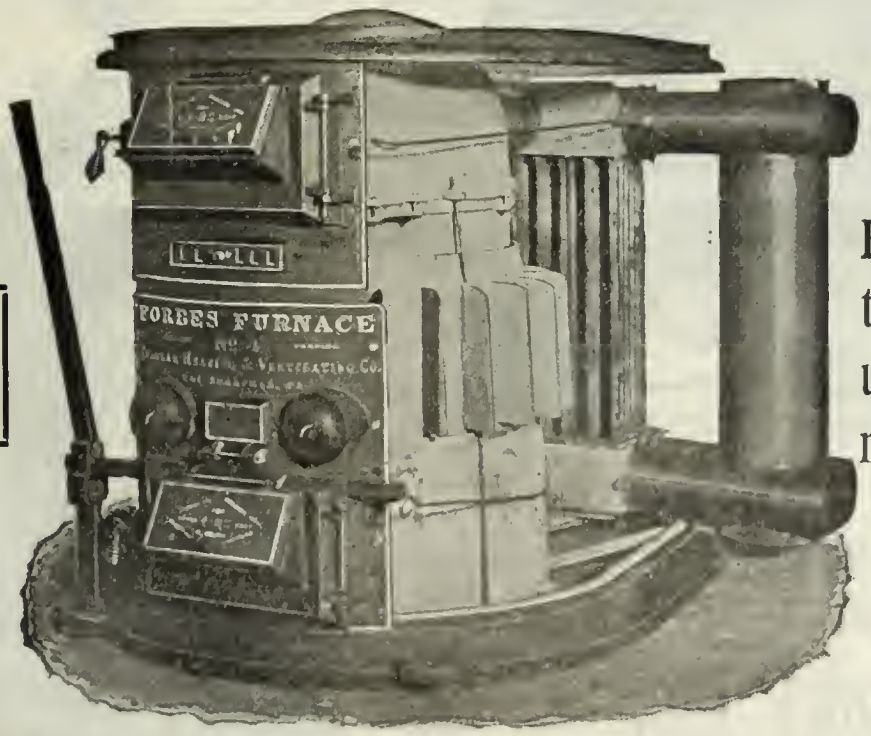
During the greater part of the winter the house had to be kept at a very high temperature, owing to illness in the family. Your furnace did all it was called upon to do, and on a remarkably small amount of coal.

Last winter a furnace of a popular make failed to even warm the house comfortably, and burned fully 50% more coal.

I think your furnace is all you claim for it, and do not hesitate to recommend it to any one desiring comfort and economy. Very truly,

5027 Florence Avenue. M. J. FALLS.

SEND FOR CATALOGUE



COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

TUBULAR HEATING AND VENTILATING CO.,

228 QUARRY STREET, PHILADELPHIA.

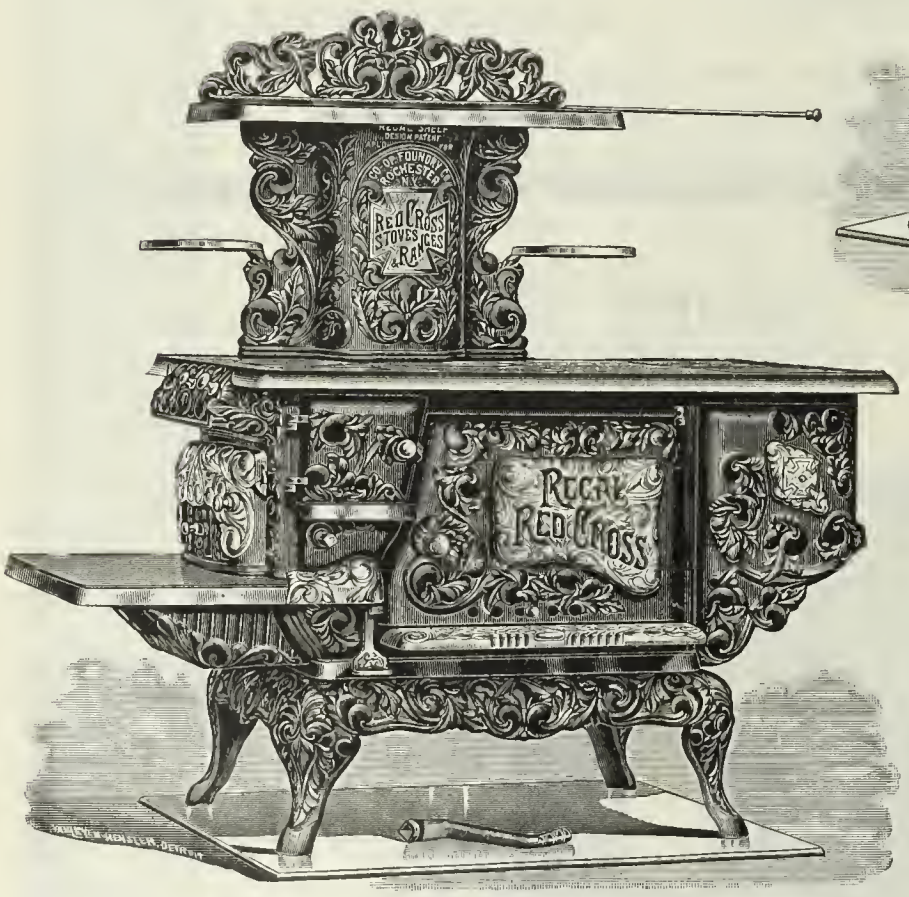
THE RED CROSS

STOVES & RANGES
HOT AIR FURNACES
HOT WATER HEATERS

Popularity is the only true index of merit.

Our Trade-Mark of the Red Cross is the index of popularity.

Red Cross Sunbeam.



New Red Cross Oak.

Robinson & Sons,

107-109 Lake St., CHICAGO, ILL.,

WESTERN AGENCY FOR

Co-operative Foundry Co.,

ROCHESTER, N. Y.

The most complete Line of Stoves and Ranges in the American Market.

Everything about the Only Round Oak
is genuine:
No idle claims are made:
No promises are unkept:
None are untrue:
The Counterfeit "Oak"
Ninety-nine times
out of One Hundred
cannot be sold—only
under the name—Round Oak—
made famous by

"Beckwith,"
Dowagiac.

1897 GOLD COIN BASE BURNER.

THE LEADER

Of our Extensive Line.

A Wonderful Heater.

Constructed upon scientific principles, it has larger radiating surface and more cubic inches of hot air circulation than any stove on the market.

We have in our assortment FOUR distinct series to select from, which enables us to supply any demand.

A *"GOLD COIN AGENCY"* is a valuable one. You can secure it on most favorable terms. Write us for information and prices.

Chicago Stove Works, CHICAGO. AND **Bussey & McLeod Stove Co.,** TROY. N. Y.

....The Gem Monitor.

"The Finest
Low Priced Range on Earth.
A New Range Throughout."

WITH ENCASED RESERVOIR.

Complete! Perfect! Durable and Handsome!

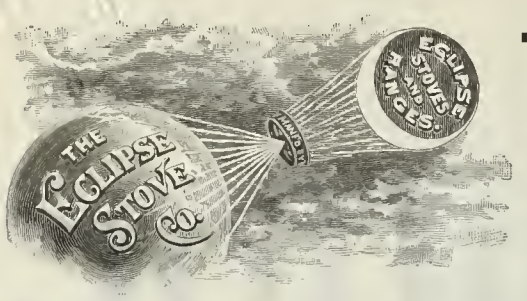
WITH HUNDREDS OF IMITATORS, BUT NONE JUST LIKE IT.

Are you a dealer alive to your interests and that of your customers? if so, write and

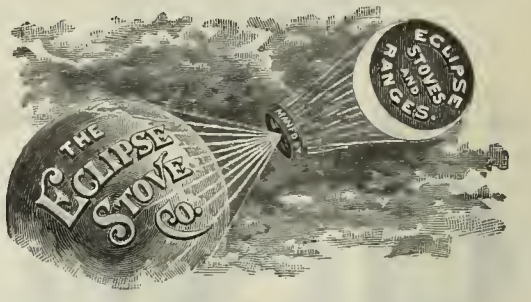
Secure the Agency and place this Range on your floor and your competitor will turn Green with Envy. Write for our Low Prices, they will astonish you.

THE WM. MILLER RANGE & F'CE CO.

CINCINNATI, O.



TAKE FOR YOUR MODEL



The MODEL ECLIPSE

AN ELEGANT WOOD COOK.

SIZES:
8-20, 8-22, 8-24,
9-20, 9-22, 9-24.

STYLES:
Square Top,
Bracket Reservoir

EVERY STOVE WARRANTED.

IT WILL PAY YOU TO WRITE FOR OUR NEW CATALOGUES:

No. 14,
The Triumph Eclipse Steel Range Line.

See adv. on page 31.

No. 15,
Cast Ranges, Cooks and Heaters.

THE ECLIPSE STOVE CO.,
MANSFIELD, O.

REPOSITORIES:
For Minnesota, No. Dakota and So. Dakota:—MINNEAPOLIS, MINN., H. E. COOK, Mgr., No. 208 Nicollet Ave.
For Nebraska, Western Iowa and Black Hills:—OMAHA, NEB., OSCAR MILLSAP, Mgr.
STREVELL HDW. CO., Agents for State of UTAH.

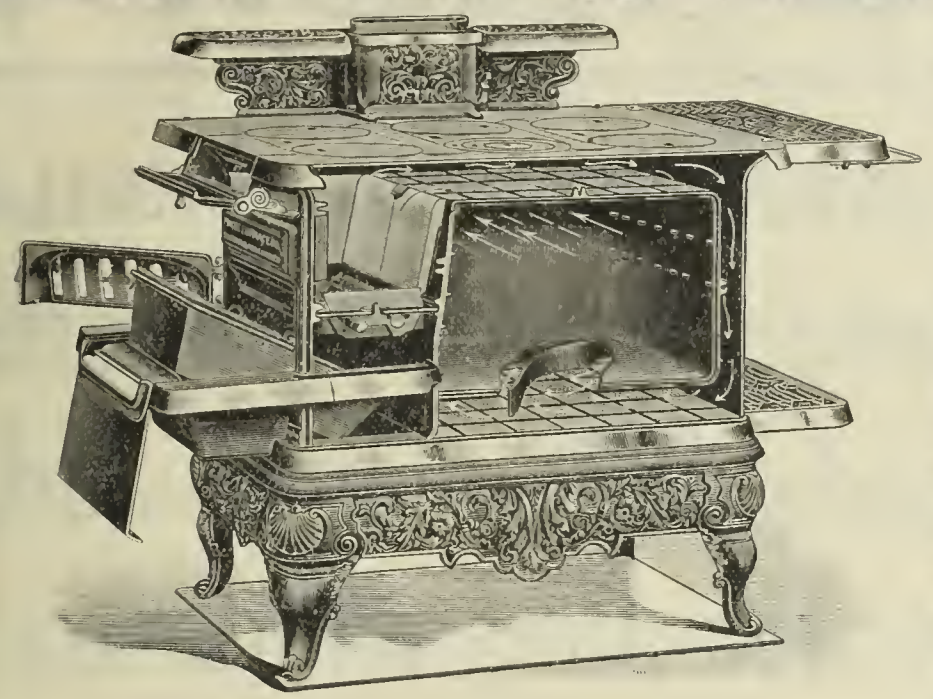
The Clermont Oaks

Are Moulded in one solid jointless piece, making them absolutely air tight.
HAVE LARGE PIPE COLLARS, molded integrally with the main top.
WITH PATENT SCREW DRAFT REGISTER supplies any amount of air required.
AND HOT BLAST SMOKE COMBUSTION REGISTER is also of screw type.
BALL BEARING GRATES make a direct saving in wear and tear.
CORRUGATED CAST IRON BOWLS allow for Expansion and Contraction.
V-SHAPED JOINTS prevent the bowl from buckling.
NO SHORT measurements in Clermont Oaks.
PATENT ANTI-BUCKLING RINGS prevent drum from buckling.
DRUMS riveted direct upon the fire pot.
RADIATING SURFACE reflects directly upon the floor.

Before placing your order be sure to get our prices and apply for agency early.

The Gem City Stove Company,
DAYTON, OHIO.

MAGEE "GRAND" MAGEE



Showing interior construction of the Magee Grand Range.

It is the *Best Range* in every particular *that has ever been produced.*

SOME INTERESTING FACTS:

The "Magee" Ranges in their construction differ from all others in having a SHEET-FLUE. Four very desirable objects are gained by this.

1st. A more equal distribution of heat AROUND the oven.

2d. A more equal distribution of heat UNDER the oven.

3d. A more PERFECT system of OVEN VENTILATION.

4th. A DIRECT connection with the chimney.

"Magee" Ranges are the only ones having a FLUE at the BACK of the oven.

It will pay YOU to examine these goods.

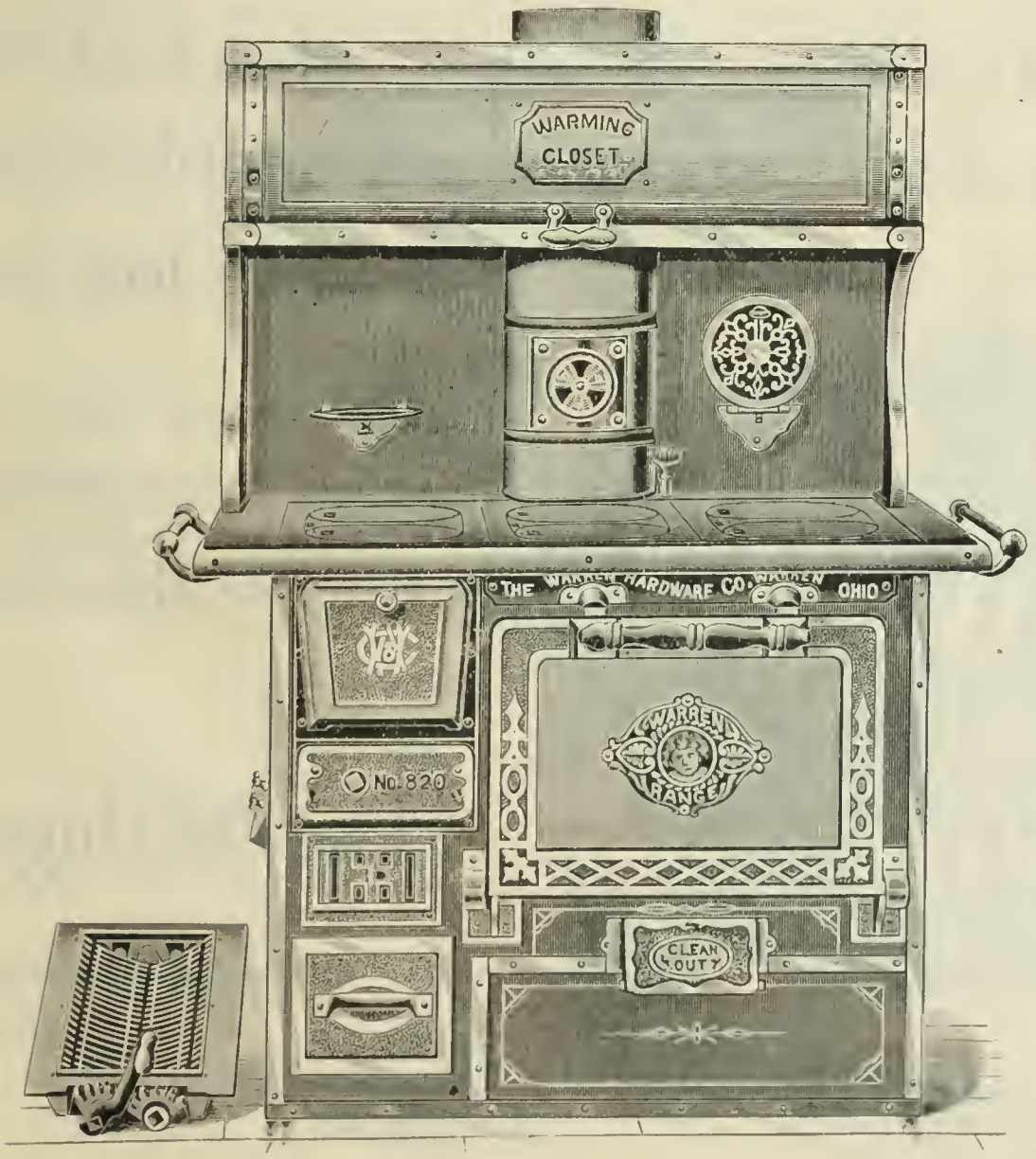
Made in all the usual Sizes and Styles, 7-18, 8-18, 8-20 and 9-20.

"There is pleasure as well as profit in selling this range."

REMEMBER the name "MAGEE," and that we have a full and complete line of Ranges, Furnaces, Combination, Hot Water and Steam Heaters, fully warranted. CORRESPONDENCE SOLICITED.

MAGEE FURNACE CO., *Makers Highest Grade Heating and Cooking Apparatus for all uses.*

32-38 Union St., BOSTON.
86 Lake St., CHICAGO.
27 New Montgomery, SAN FRANCISCO.



Warren Steel Ranges.

Made in 16 Sizes.

126 Different Styles.

Substantially built. Heavy in construction. Elegantly finished and fully guaranteed. The line to handle, as they are strictly first-class and up to date. Get our prices, which will interest you. Write for catalogue, which will be gladly furnished.

Manufactured by the

Warren Hardware Co.

WARREN, OHIO.

W. D. SAGER, No. 54 N. Clinton St., Chicago, Ill., Wholesale Agent for Chicago, West and Northwest.

M. F. TALLMAGE, No. 82 Seneca St., Buffalo, N. Y., Wholesale Agent for Buffalo and vicinity.

DANVILLE STOVE & MFG. CO., Danville, Pa., Wholesale Agent for the East.
No. 284 Pearl St., New York, N. Y.
No. 107 N. 2nd St., Philadelphia, Pa.

CONSIDE

It is to every one's advantage
making a decision, and the mercha
merit of goods in his line, and t
them, before deciding which to ha

In "Garland" stoves and ranges we offe
possibly be made for the price asked, and w
meet the requirement, being the peers of any

We always keep abreast or ahead of the
most experienced workmen and supply most
to be as low as

Our wares are the
facilities for marketing

Give the above facts

The Michigan

Largest Makers
in th

DETROIT, CH

R WELL.

t to consider a subject well before
it should look thoroughly into the
e advantages offered for marketing
ndle, for his own interests.

the very best goods of their kind that can
ere lower-priced stoves are desired "Michigans"
line made, except "Garlands."

times in styles and improvements, employ the
excellent goods at prices which we guarantee
qual grades can be bought for elsewhere.

best advertised, and the
hem are unsurpassed.

me thought before buying.

Stove Company,

Stoves and Ranges
World,

AGO, BUFFALO.

1835 1897

.....SIXTY-TWO YEARS IN BUSINESS.....

The Survival of the Fittest.

For 62 years the Acorn Line of Stoves has been before the trade. During that period numbers of competitors have sprung up and many of them have passed away. The Acorn Line has gone on steadily advancing, always growing in popularity and increasing in sales. It now commands a unique position in the trade.

1st. The oldest Trade-Mark Line of Stoves and Ranges in the world.

2d. The line with the largest number sold and in use in the world.

3d. The largest and most complete assortment of stoves and Ranges made under one name.

The Acorn Line, whilst the oldest in years, is the youngest in enterprise and push.

No old traditions of the musty past hamper the efforts to satisfy the trade.

PROGRESSIVE IN EVERY POINT.

ALWAYS MOVING AHEAD.

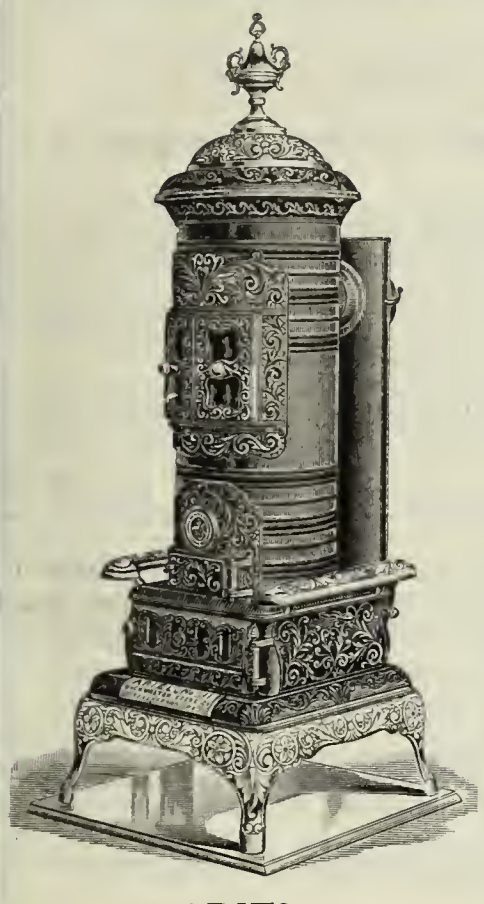
ACORNS MEAN PERFECTION.

Rathbone, Sard & Co.,

Albany, N. Y.
Chicago, Ill.
Detroit, Mich.
Aurora, Ill.

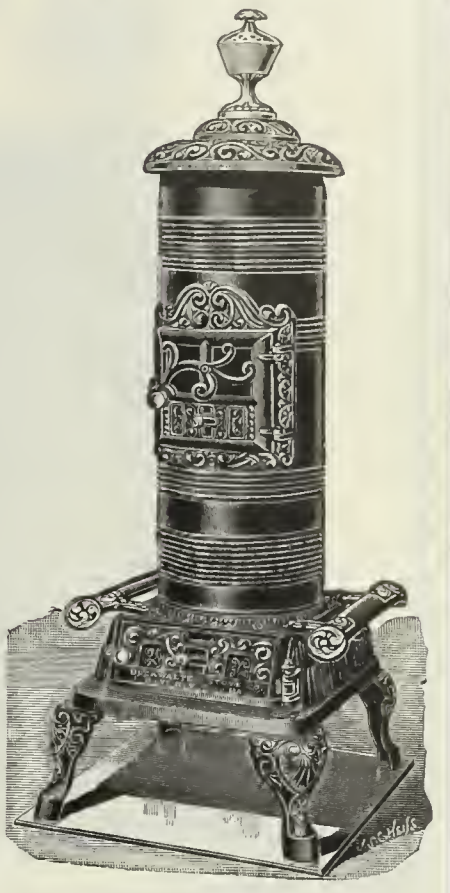
Eastern Foundries, ALBANY, N. Y.
Western Foundries, AURORA, ILL.

IN PURE BOSTONESE,



ARIEL.

NUBIAN.



CAPTAIN.

THEY ARE ARTISTICALLY CORRECT.

WRITE US ABOUT THEM.

Built for the most critical trade—the

Grand Apollo.

Solidly Heavy,
Large Flues,
Scientific Fire Box,
Oven Indicator,
Detachable Reservoir,
Polished Nickel Edges.

"THE PEER OF ANY IN THE EAST."

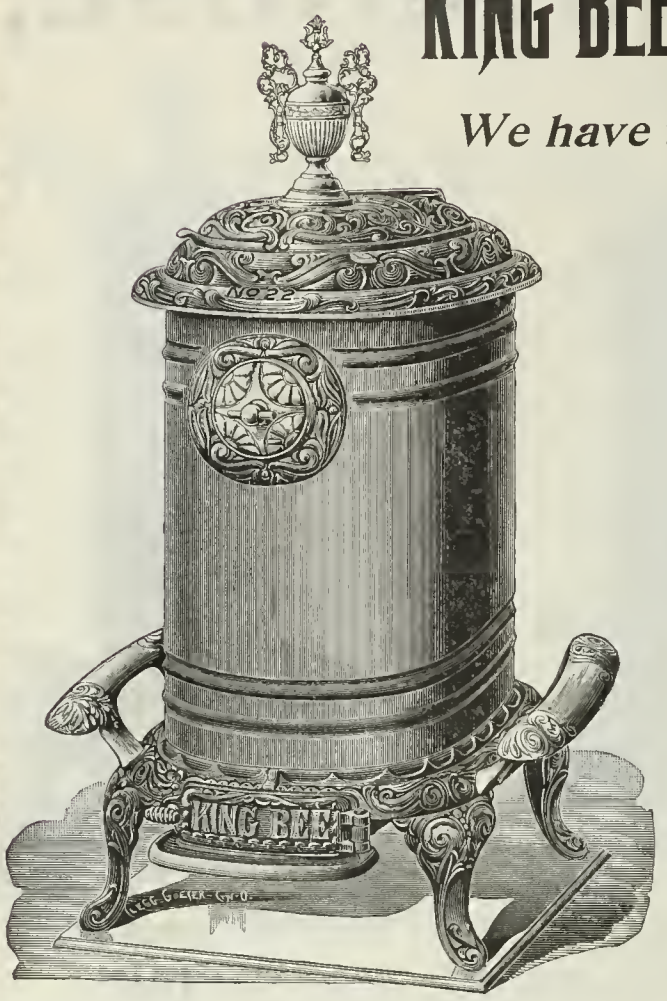
SEND FOR CIRCULAR.

BUCKWALTER STOVE CO., - Roversford, Pa.

KING BEE AIR TIGHT WOOD HEATER.

We have the King Bee of them all.

You can have it if you want it.



The **King Bee** is a striking example of the motto "Not How Cheap, but How Good," and yet the price is kept within the reach of all.

The **King Bee** has cast top and base, with deep ash pit, has air tight ash door in base and handsome nickel foot rails and urn. Cast swing top and inside swing cover.

It has our patent down draft hot blast flue, which heats the air to a very high temperature before entering the stove, and which has made our Peoria Base heating stove so popular and salable.

To this down draft a patent screw register is attached, which will never get out of order and which controls the draft perfectly.

The **King Bee** is mounted with Wood's Best Planished Russia Iron No. 26 and lined with best refined iron No. 20. There is a space left between the outer body and lining which prevents heating red hot.

We also mount the stove when desired in cheaper form, with smooth sheet steel; but the difference in price is poor economy.

Do not buy a stove with a single steel body, as they soon discolor. Get the double body **King Bee** mounted in the best form and you will make no mistake. We make three sizes, No. 22, No. 25 and No. 28.

Write for prices and order sample at once to compare with others.

CULTER & PROCTOR STOVE CO., - Peoria, Ills.

Monarch Blue Gas Flame Oil Heating Stove.

The phenomenal success of the "Blue Flame" Oil Burner of the past two years has created a "Macedonian Call" for a heater made on the same lines, and the "Monarch" steps forward to supply the demand. It has been on the market one year, and for the season of 1897-8 is presented with several important improvements which a year's experience has suggested and we offer it with all confidence in its efficiency, cleanliness, intense power and great comfort.

There are no others with Blue Flame.

Top tilts back to light the Burner or to remove the Tank. Mounted on Casters. The entire Stove is richly nickeled and beautifully polished. Brass Tank. Burner cannot creep up. Will not smoke or smell. There is only one "Blue Flame" Heater and that is the "Monarch."

WRITE FOR PRICES AND TERMS.

THE MONARCH STOVE CO.

MANSFIELD, O., U. S. A.

DANVILLE STOVE & MFG. CO., Danville, Pa., New York, N. Y., and Phila., Pa., Agents for Eastern States.

Hamilton Oak.

No stove has ever been made that has given such universal satisfaction as the **Oak Stove, if properly constructed.**

But in order to be properly constructed, it shonld first be absolutely air-tight; therefore, in order to have a stove absolutely

Air-tight, Gas-tight and Fire-keeping,

it must be made with a **Jointless Base,** and registers that can be closed absolutely tight, and made in such a manner that they remain tight.

We are now making, under several patents, **a Base without any Joints,** that has a large ash-pan and patent screw registers; and in order to throw the heat to the floor, we use **a broad deflecting Pot Ring,** which is a new and desirable feature.

Examine carefully our **Patent Anti-Buckling Ring.** The greatest invention of the age for Oak Stoves.

In the **Hamilton Oak,** with Sqnare Base, we have embodied all these essential features, and have prodnced the **best and handsomest Oak Stove** in the market, and at a moderate price, considering the increased cost of this stove.

Satisfaction Guaranteed.

Time Tried and Fire Tested.

We make other stoves, too. Send for our complete catalogue. . . .

CULTER & PROCTOR STOVE CO., - Peoria, Ills.

A DEALER'S KLONDIKE.

START A

GOLD MINE

OF YOUR OWN

By Handling

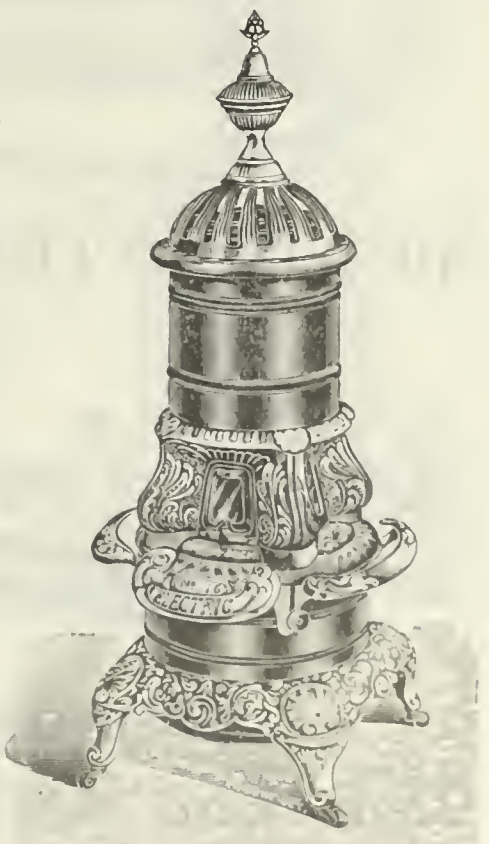
ELECTRIC OIL HEATERS.

Made in 3 Styles.

Artistic Ornamentation.

We wish to call partienlar attention to the Air Circnlation and Expansion, Radiation, etc., as involved in the construction of the **ELECTRIC,** as compared to the interior arrangement of certain oil heating **LAMPS** placed on the market under the misleading appellation of *Oil Heating* **STOVES,** illustrating the audacious assumption of the manufacturers in claiming snch distinction.

The **ELECTRIC** has the **greatest radiating surface** and its **heating capacity** is greatly **increased** by the application of our **ventiduct principle,** involving **four hot air flues** which take up the cold air from the floor and pass it through the stove and ont at the top, heated to a high degree.



Made in 2 Sizes.

Graceful and Symmetrical in the Highest Degree. **Perfect Proportions.**

Send for Catalog and Discounts of the most complete line of Oil Stoves manufactured.

ELECTRIC OIL STOVE CO., - - - HOMER, MICH.

16 STYLES OIL HEATERS

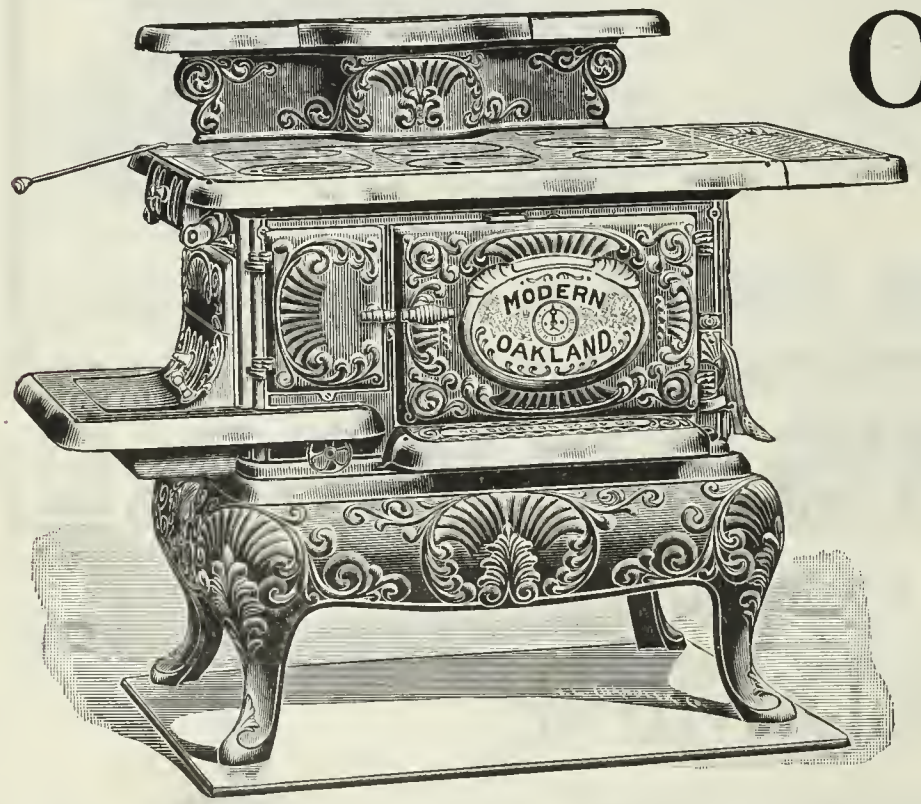
now ready. Possess all the advantages of long experience (1844 to 1897) in the manufacture of lamps. The name MILLER is a guarantee of quality. Send for our catalogue No. 57, just out, and see the styles. Many new features.

LAMPS FOR ALL PURPOSES.

EDWARD MILLER & COMPANY,

Factories and General Office, Meriden, Conn.

STORES: 63 Pearl St., Boston, Mass., and 28-30 West Broadway, New York.



OAKLAND

Ranges and Parlor Stoves.

Exclusive features are found in these goods which every housekeeper appreciates, making them quick sellers.

..1897..
Fall Catalogue
NOW READY.
COPIES FREE.

NO. DIGHTON CO-OPERATIVE STOVE CO., No. Dighton, Mass.

Richmond RANGES

THE DEALER

Wishing to Supply only the Best should Acquaint Himself with

THESE PRODUCTIONS.

ECONOMICAL,
DURABLE AND EFFICIENT.

A REPUTATION OF THIRTY YEARS.

RICHMOND STOVE CO., NORWICH, CT.

Richmond FURNACES

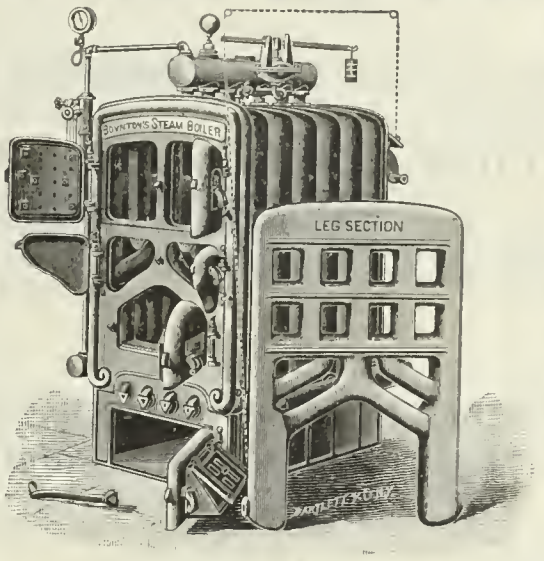
BOYNTON

**HOT WATER HEATERS,
STEAM BOILERS,
FURNACES,
RANGES, ETC.**

BOYNTON'S NEW GAS TIGHT FURNACE.

Remember it is the name BOYNTON we wish you to recall when in want of steam heaters, hot water heaters, furnaces, ranges, etc. Our goods are for sale by best dealers all over the country.

Send for Catalogue and Prices.



BOYNTON'S STEAM BOILER.

The Boynton Furnace Co.,

207 and 209 Water St., New York. 44 and 46 Dearborn St., Chicago.

PURE AIR SYSTEM OF GAS HEATING

AS ARRANGED IN THE

Franklin Electric Gas Heater.

Franklin Electric Gas Heater.

The cold air is drawn in at the bottom and enters several tubes, and is expelled into the room, heated to a high degree of heat, through the fret-work at the top.

See sectional cut.

The products of combustion are conveyed to the smoke flue.

Natural Gas,
Illuminating Gas,
Fuel Gas.

Franklin Electric Sectional View.

Powerful Heater. Moderate in Price. Handsome in Design.

Economical in the use of Gas.

WE MANUFACTURE THE LARGEST AND MOST COMPLETE LINE OF

Gas Ranges, Broilers, Laundry Stoves, Water Heaters and Heating Stoves.

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THE ELECTRIC GAS STOVE CO., Detroit, Mich.

"PERFECT"

(TRADE-MARK.)

Warm Air Furnaces

ARE UNIVERSALLY POPULAR ALL OVER THE U. S.

They are Economical in Fuel.
They Heat Well.
They Please the Buyer.
They Please the Trade.

They CONTAIN the NEWEST INVENTIONS of the latest DEVICES and IMPROVEMENTS.

Trade wanting the Best Furnaces will do well to correspond with

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ESTABLISHED 1837,

232 and 234 Water Street, New York.
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WHERE ELSE

can you buy a stove as large as this with a

BACK PIPE,
NICKEL TOP BAND
AND
NICKEL RAILS
FOR

No. 10, ...	$4.75
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You can't get stuck much if you order a sample of the

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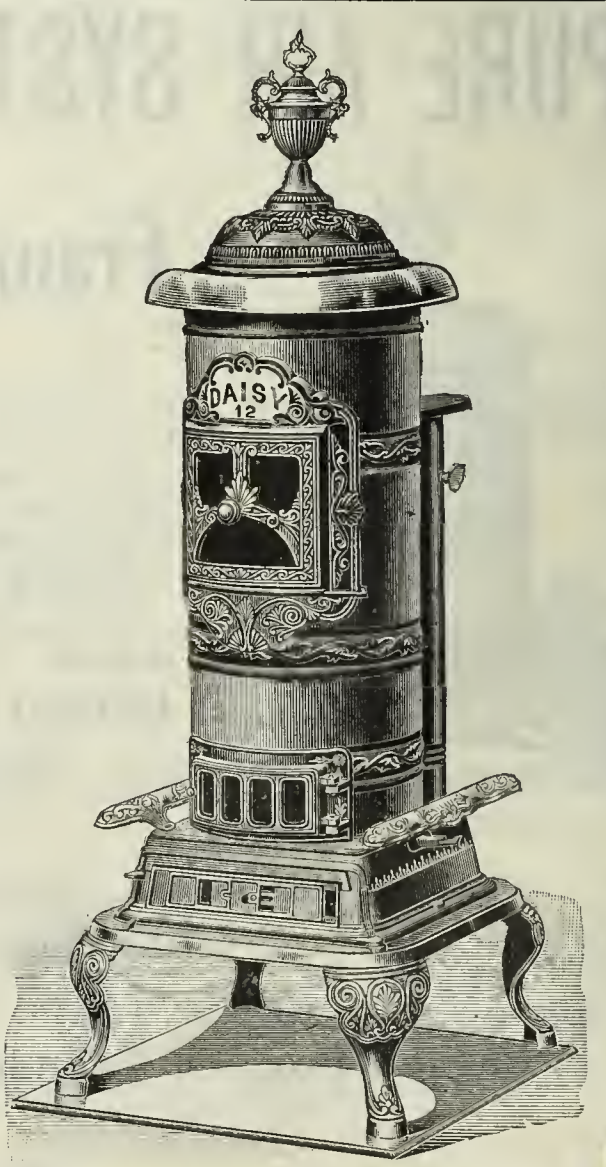

THE S. M. HOWES COMPANY,

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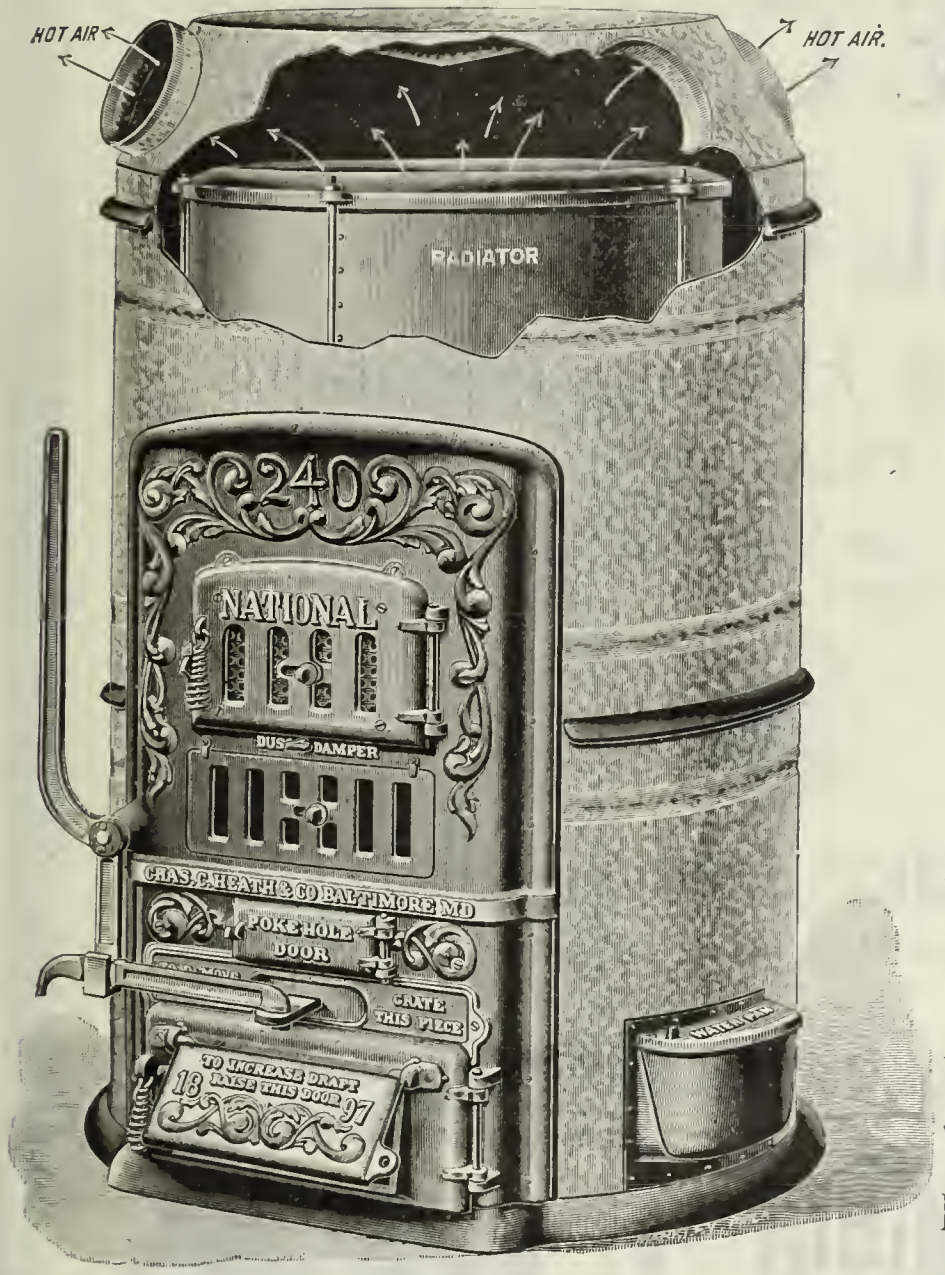
THE "NATIONAL" HOT AIR FURNACE.



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—AND—

know all about me.

A TRIUMPH IN CONSTRUCTION.

If you want the agency in your town write at once.

If there is a better furnace made it is not in this country.

YOU CANNOT AFFORD TO IGNORE THE **NATIONAL** IF YOU ARE IN THE FURNACE BUSINESS.

CHAS. C. HEATH & CO., MANUFACTURERS,
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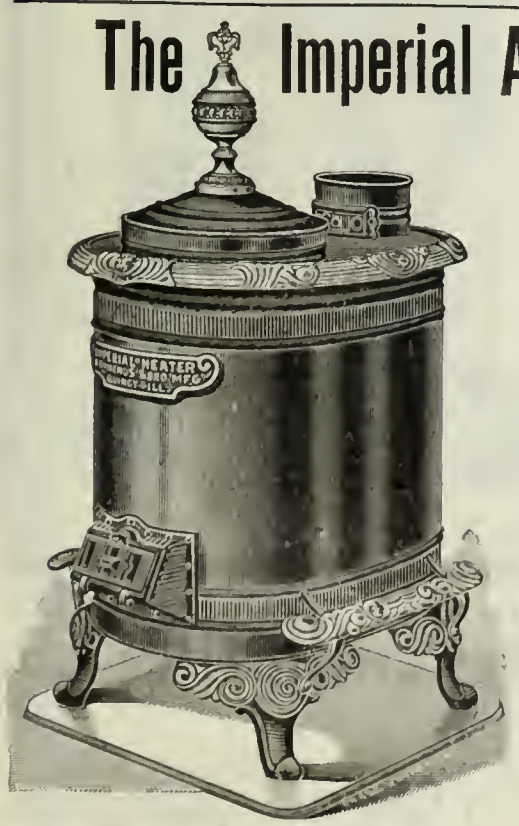
The Imperial Air-Tight Heaters.



DON'T forget in buying air-tight stoves that the reason this class of heater came on the market was because they were made of all sheet iron, which allowed the stoves to be absolutely air-tight Cast iron top and bottom stoves are no better than laydown stoves with cast ends (Todd stoves) and won't give any trade satisfaction. If you want a stove that will do the work for which it is intended buy the Imperial.

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Hardening Rubber Goods,
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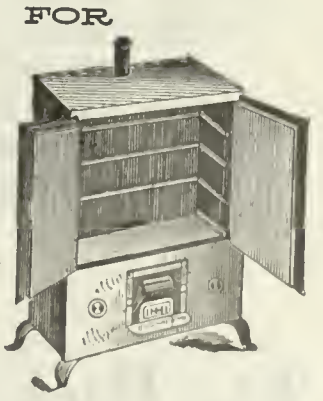

The only Oven Baking by Perfect Circulation of Hot Air.

Made in ten sizes. Send for Catalogue.

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Bicycle Enameling Ovens.

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ROYAL HEATERS.

All Kinds of Heating Apparatus.

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Royal Heaters Lead All Others.

Sold on their Merits, not on their Antiquity.

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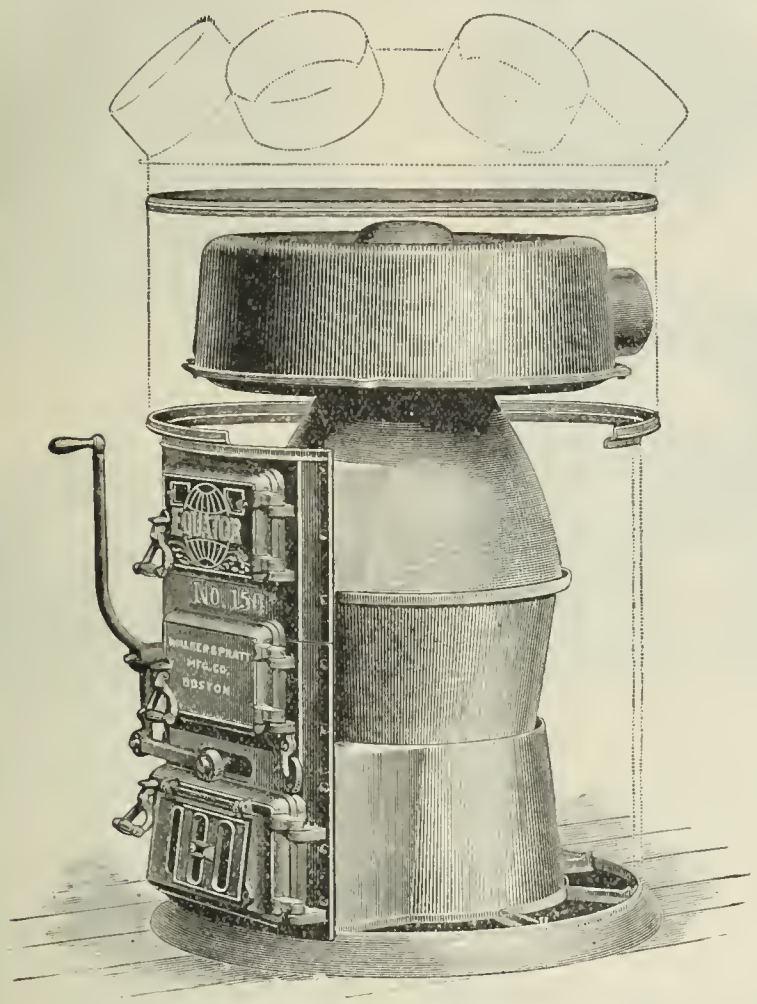
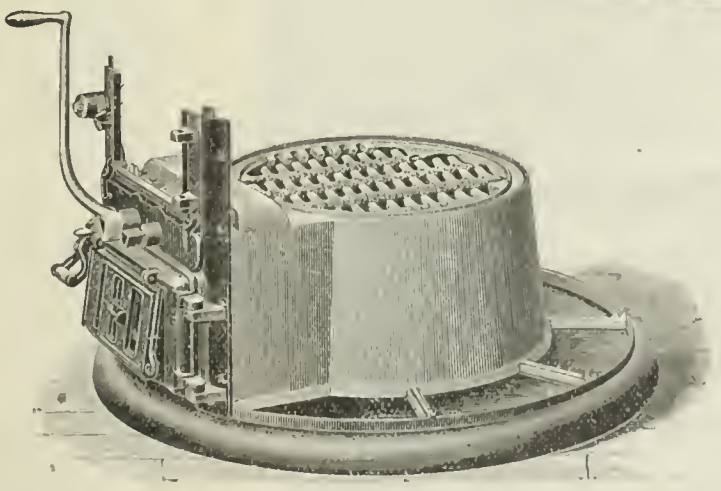
WALKER & PRATT MFG. CO., Boston.



More popular than ever this season. Draw-centre or triangular grates, cast-iron or steel radiators. Satisfactory in weight, design, durability, economy, fit, finish, style, price.

Six good sizes: 18 to 32 in. firepots.

Our triangular grate the best yet; very strong; any bar removable without disturbing any other bar; no bolts, nuts, rivets nor buttons. Cog-wheels slipped on; no pins nor bolts. Cog-wheels interchangeable and reversible; 4-bar grates may be arranged to shake all together or each pair separately. . . . .



Simplest, best, cheapest water combination; few joints; easy to erect, easy to sell. Send for special book. . . .

Shovel, poker, check-damper, enameled water-pan, air frame, bolts, fire-clay, putty with every furnace without charge.

Send for latest EQUATOR pamphlet.

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WALKER & PRATT MFG. CO., Boston.

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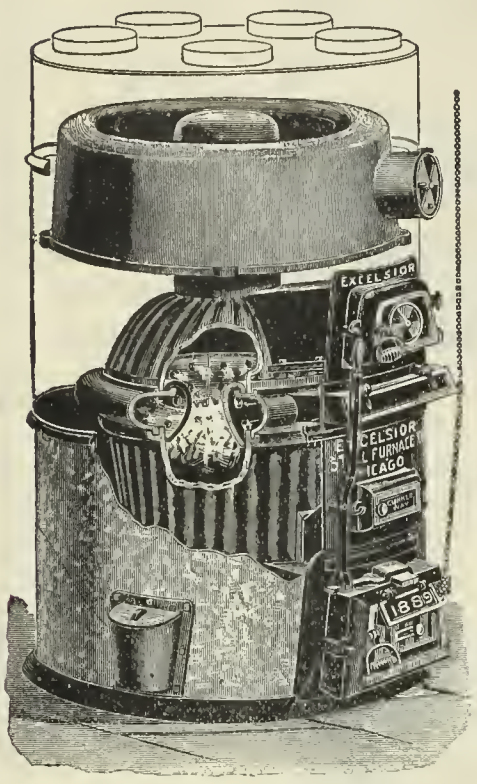
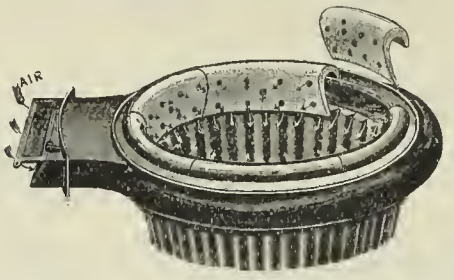
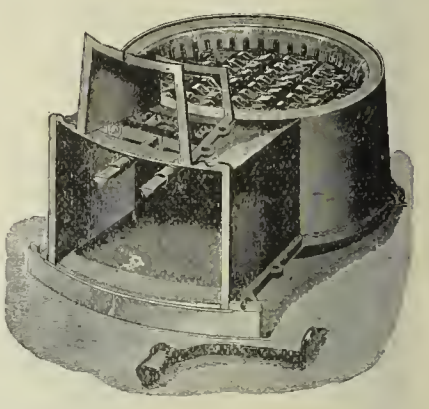
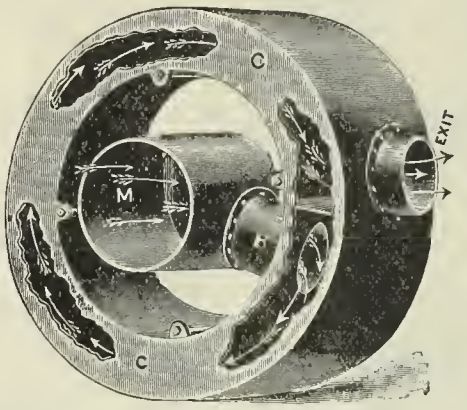




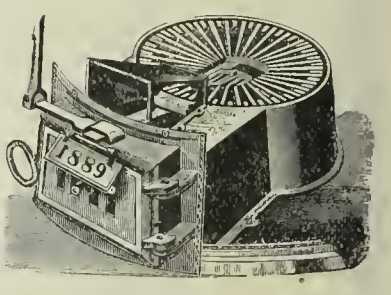
The Gas Ring.



The Grates.



The Steel Radiator.



The Excelsior "C" Pattern Soft Coal Furnace stands four feet four inches to top of Cast Iron Radiator. Steel Radiator furnished if desired. Supplied with either duplex or triangular bar grate. For Particulars address

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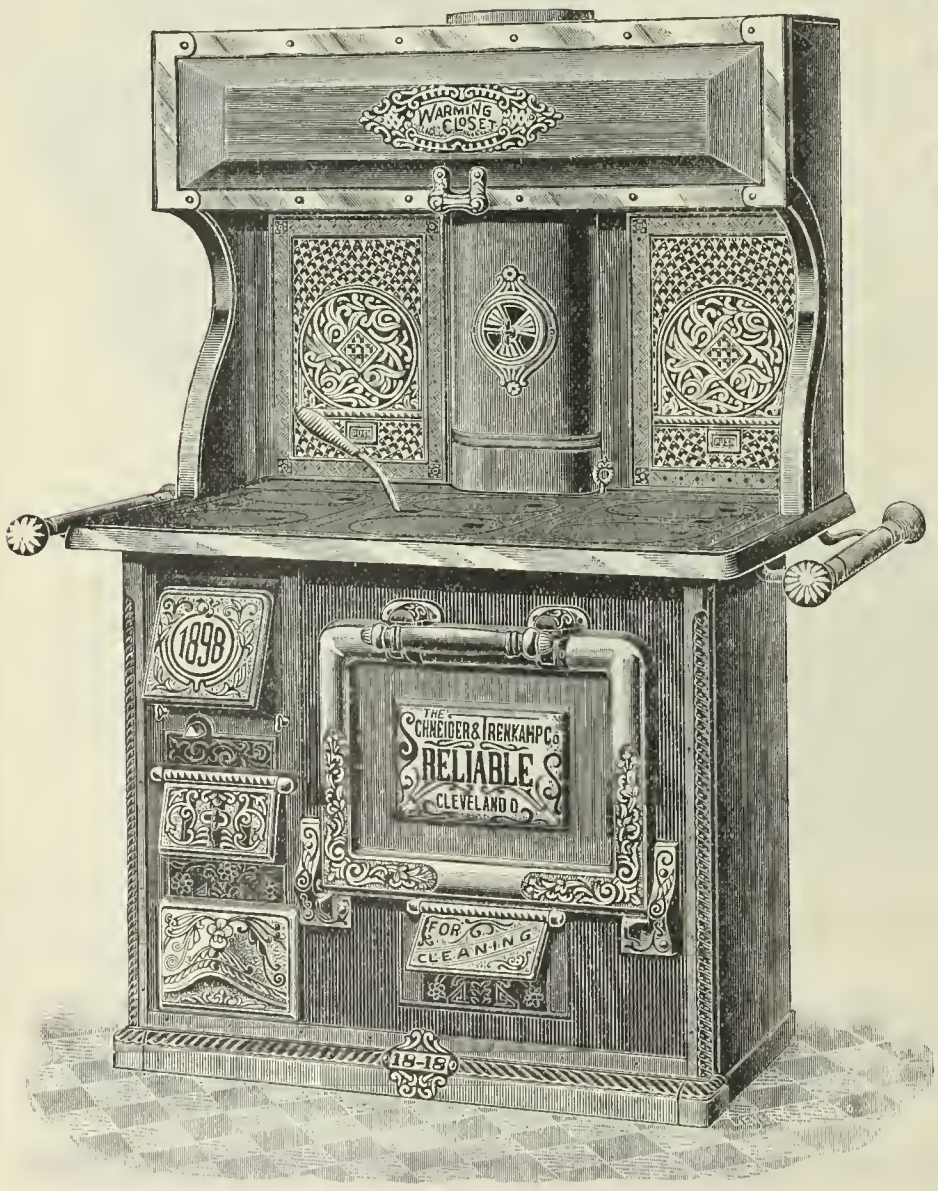

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Made in a Reliable Factory by Reliable Manufacturers known the world over for making only Reliable goods, and are handled by all Reliable Stove Dealers, are purchased by Reliable People. If you have a RELIABLE, your servant will be reliable, as it is a pleasure instead of a task to do all kinds of culinary work with a RELIABLE after using any other make of range.

There are a few other well made and well finished ranges on the market, "But not so many," and none of them equal the "RELIABLE."

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A Range Constructed of the Highest Priced Patent Leveled Wrought Steel.
Our Fire Box Linings for 1898 are the heaviest placed in any range!
Our tops will never crack from heat!
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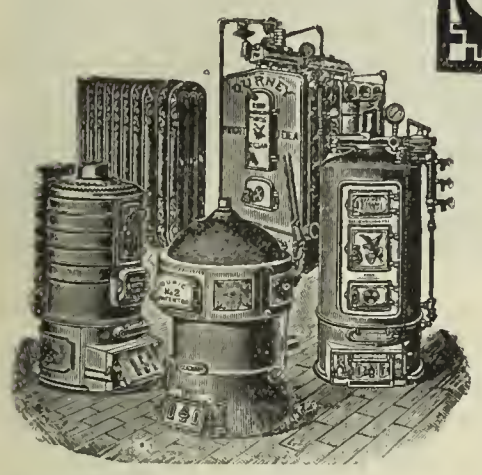

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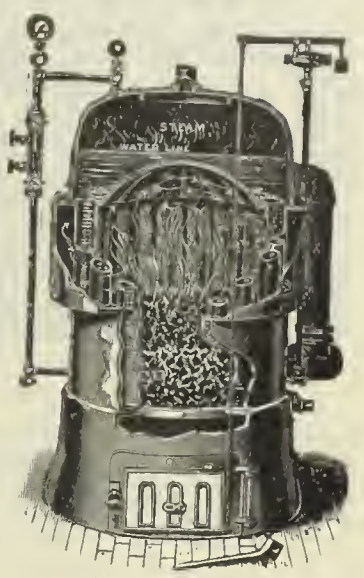

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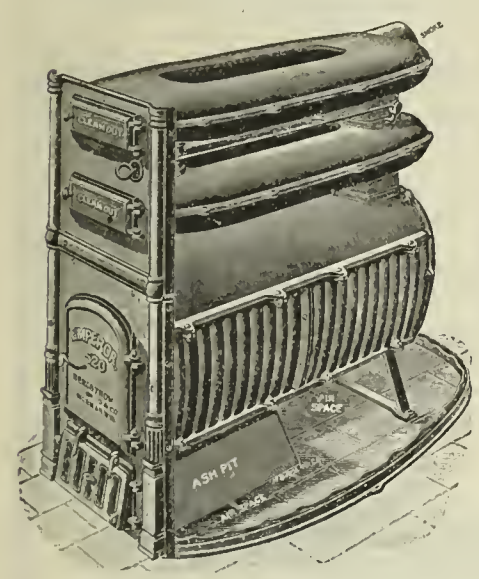

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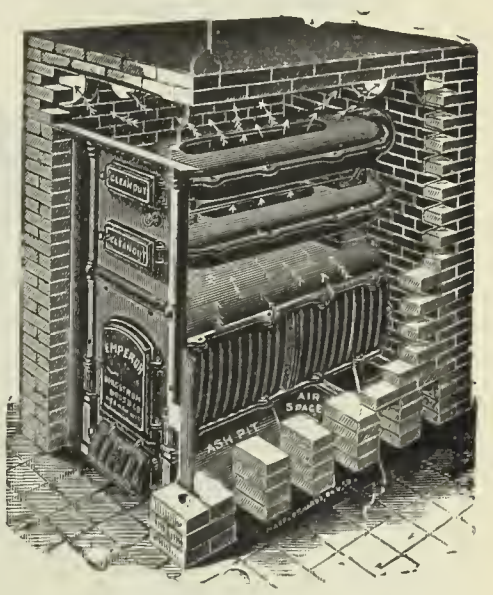

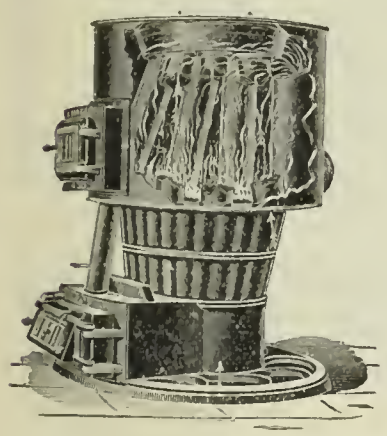

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There is positively nothing that can get out of order in any way, and the whole apparatus is GUARANTEED TO LAST A LIFETIME if it has reasonable care.

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Will Control the Fire in any
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GREATEST VARIETY.
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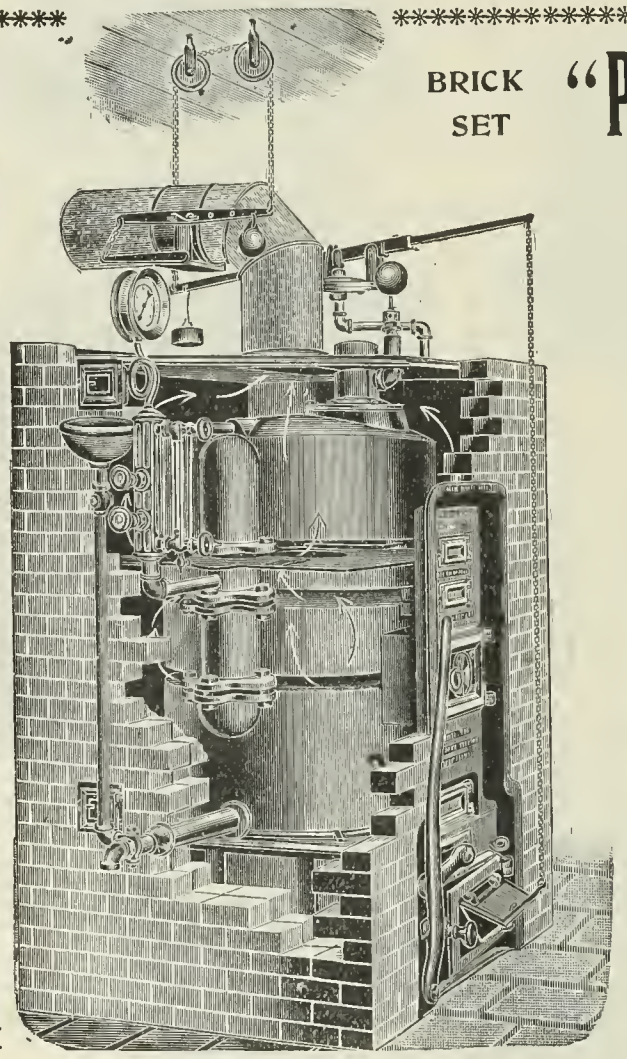

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Cut shows Boiler and how it is put together, from Ash Box to Steam Dome. Arrows show in which direction fire must travel to reach chimney.

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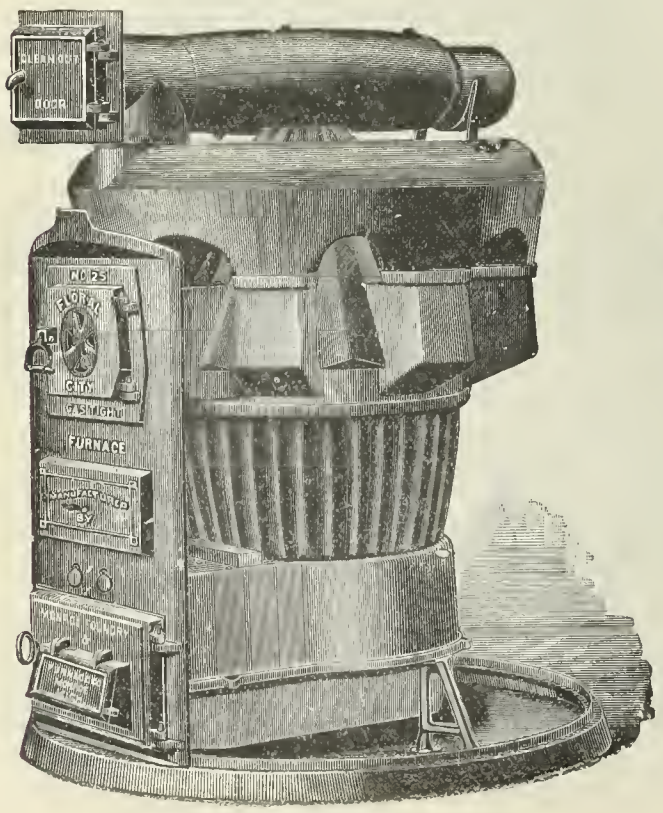

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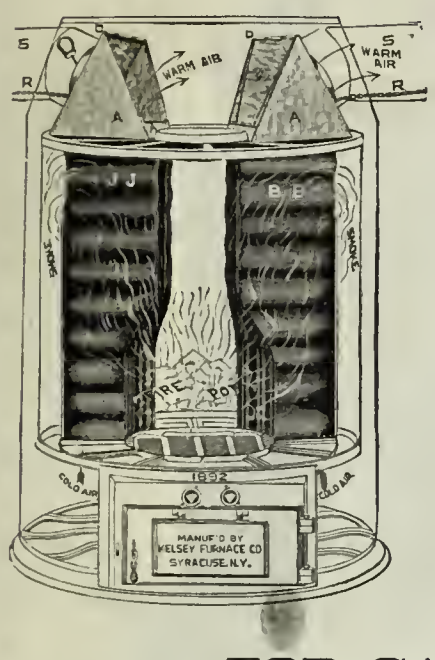

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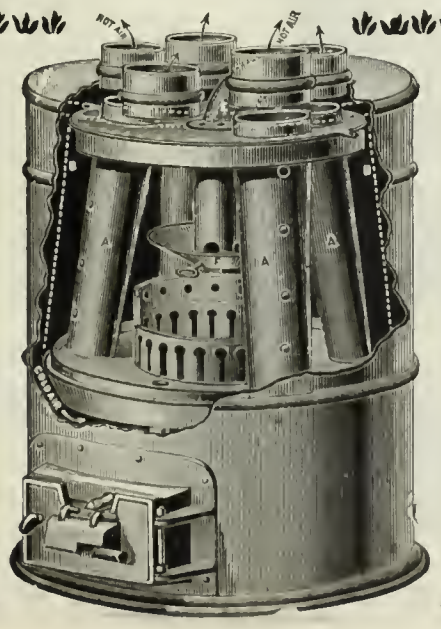

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IT WILL PAY YOU TO LOOK INTO.

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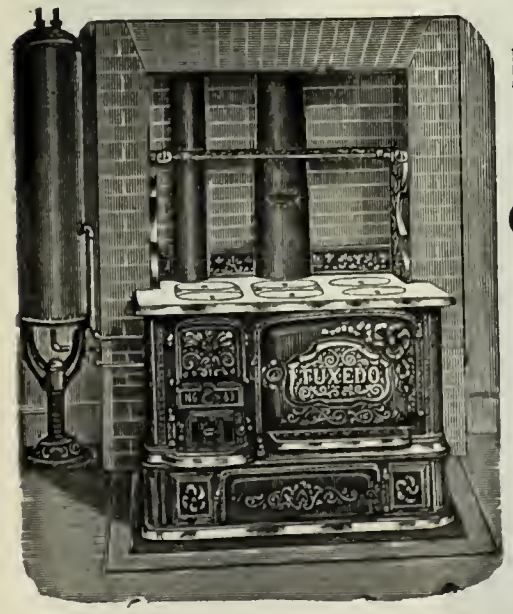

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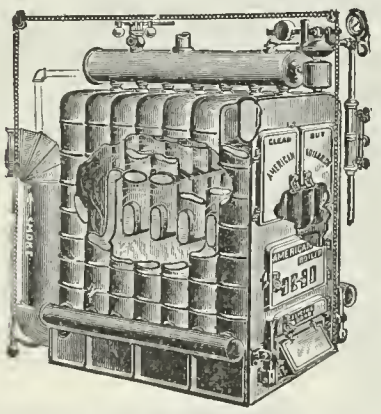

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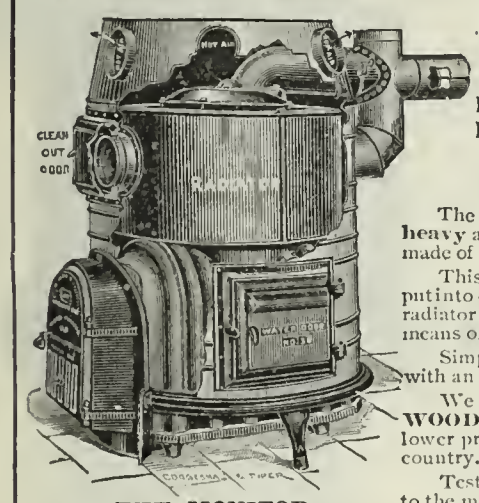

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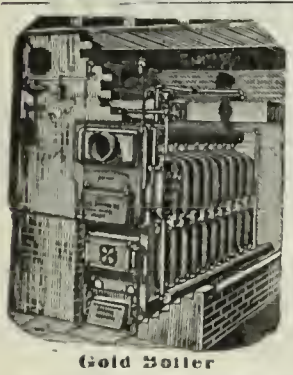

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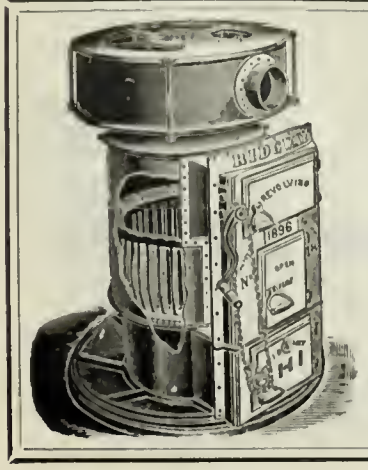

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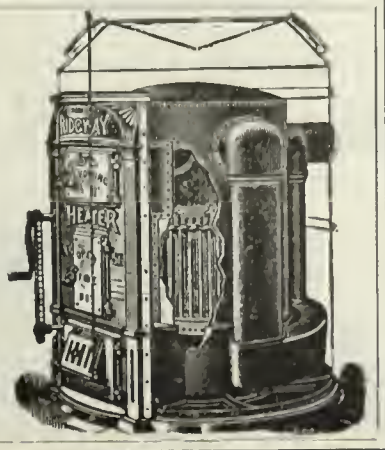

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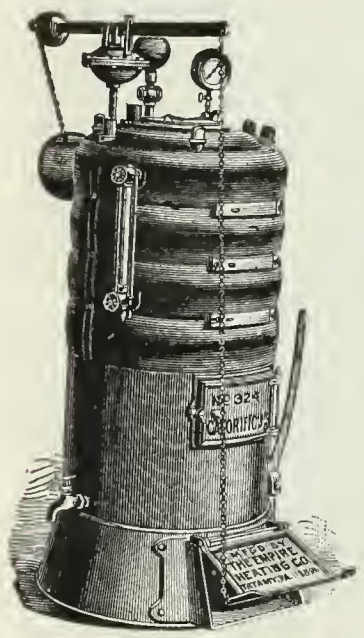

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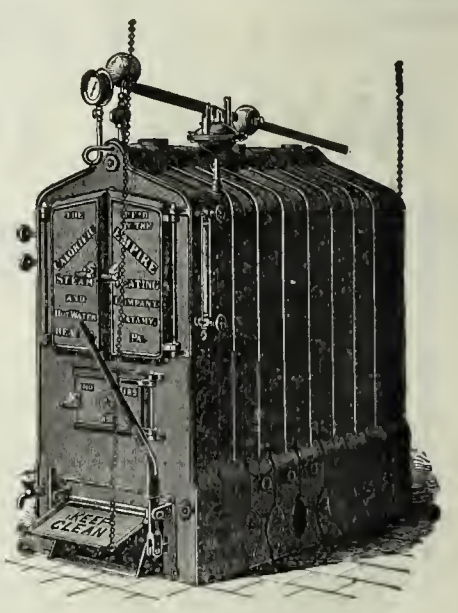

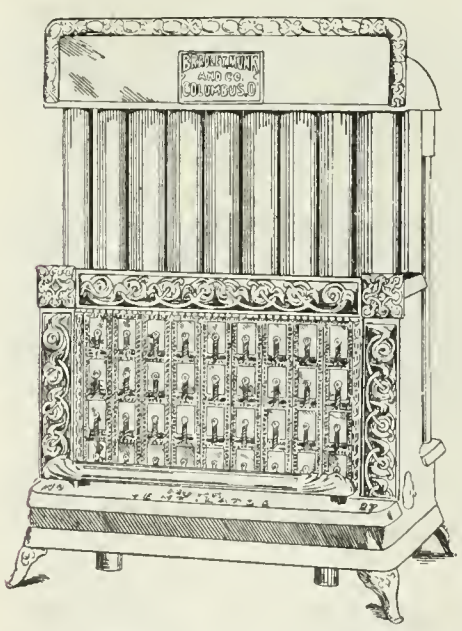

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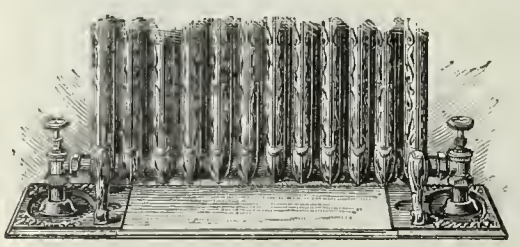

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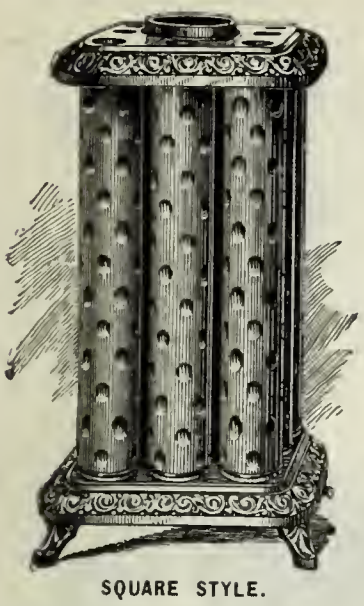

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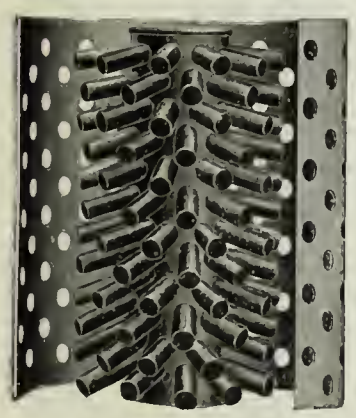

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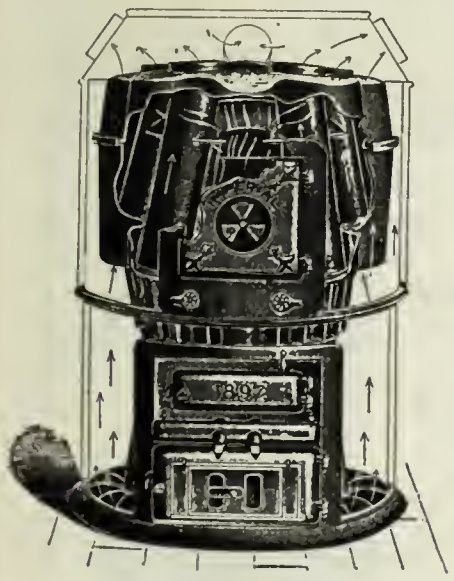

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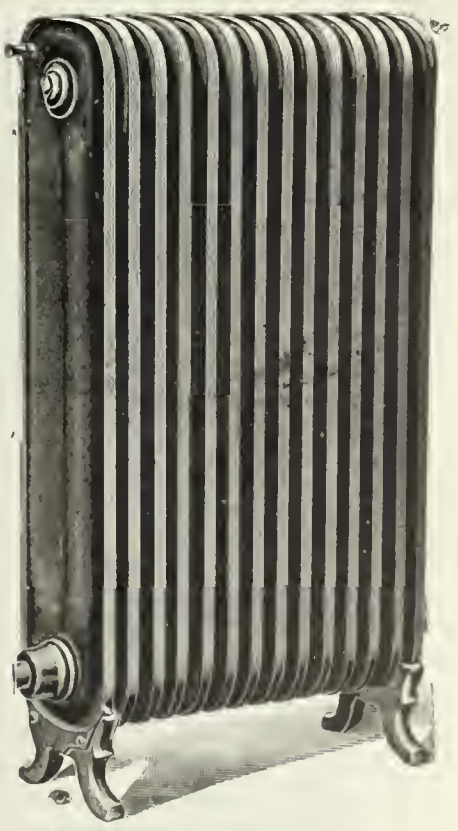

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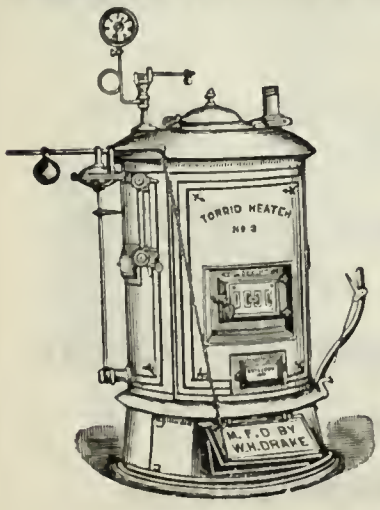

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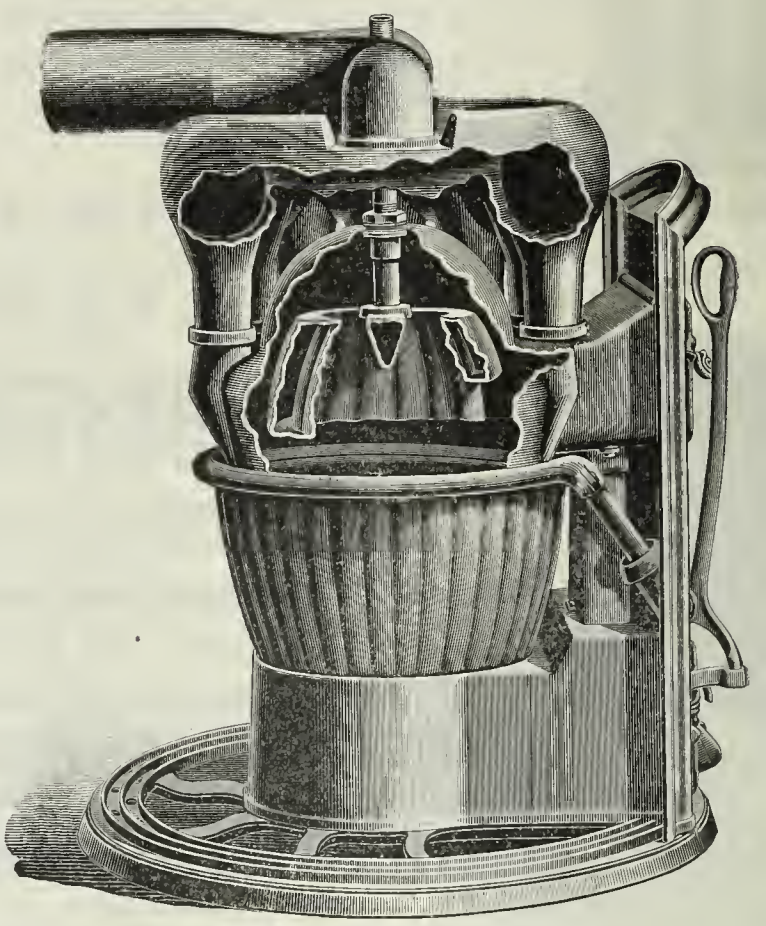

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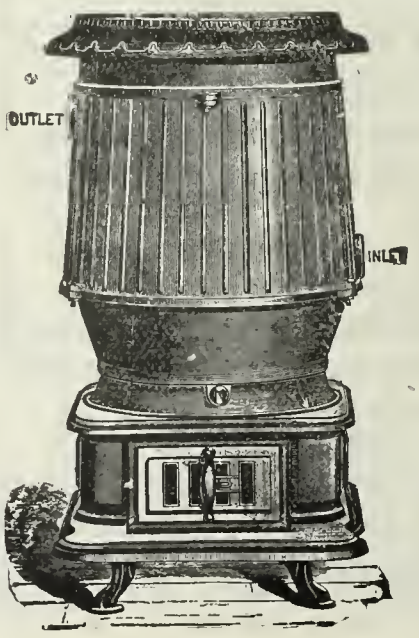

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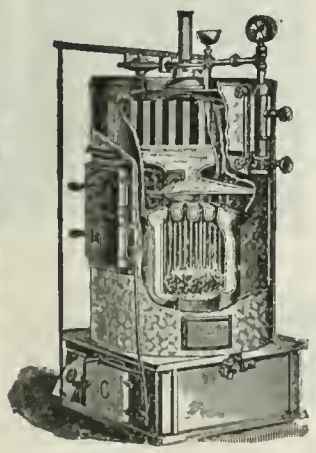

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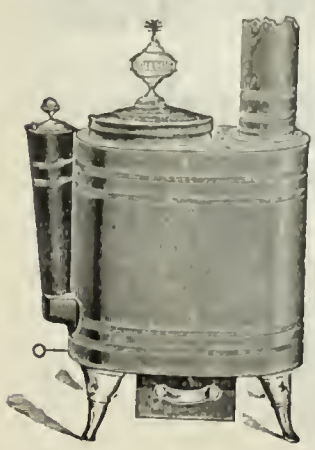

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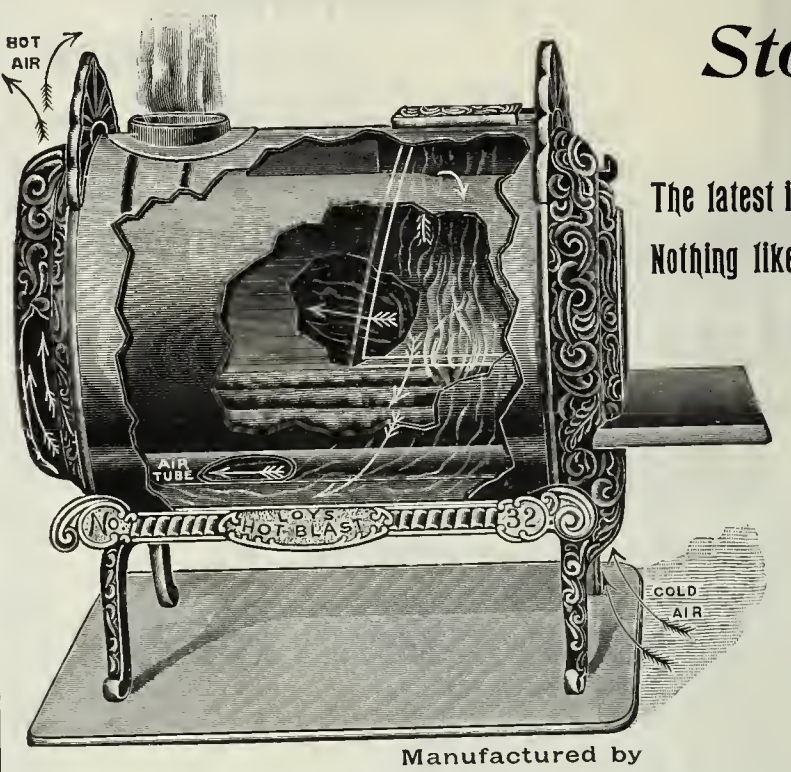

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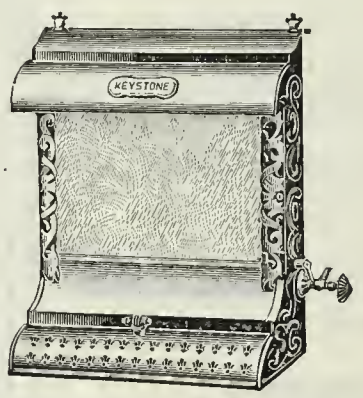

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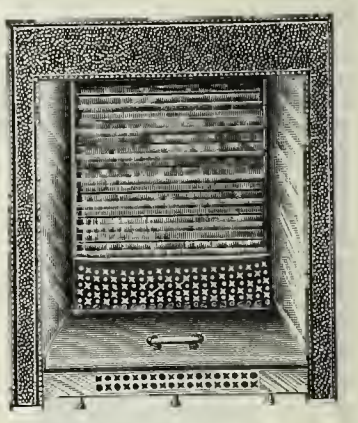

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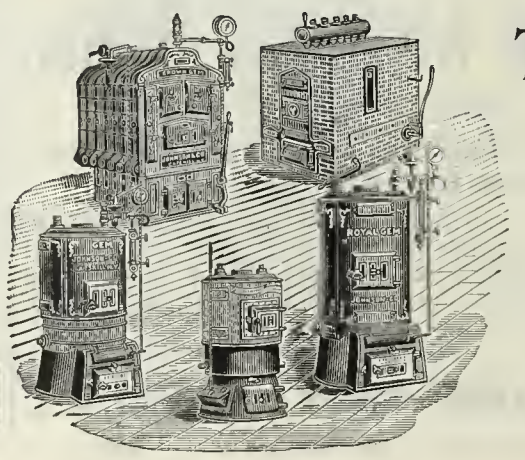

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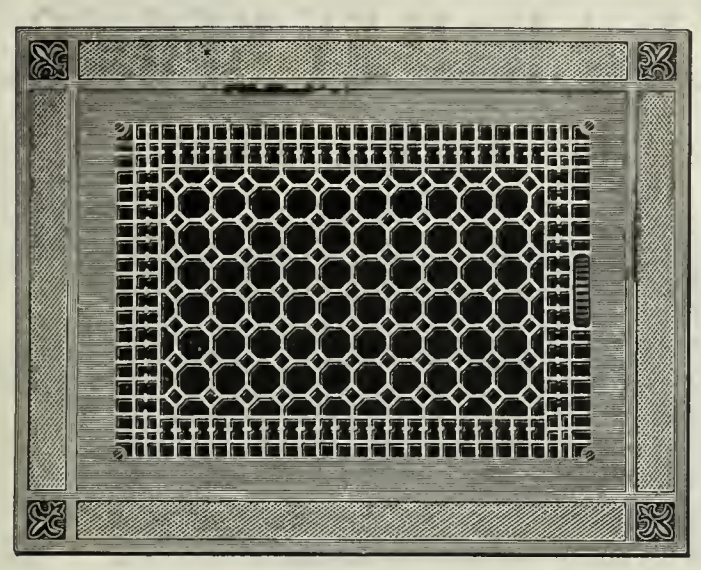

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Our Blue Book for the Register Trade contains Illustrations and Price Lists of a complete line of sizes from 4x6 to 38x42. Round Registers from 6 inch to 36 inch.

No dealer in United States should be without one of these books.

All orders are given prompt attention.

About prices! Will you kindly ask us for prices before placing your orders—or some of your nearest jobbers will be glad to quote and make prices right.

Registers electroplated in Purple, Blue, Chocolate, Black, Steel Antique, etc., etc.

Address all communications to **The Ferrosteel Company,**

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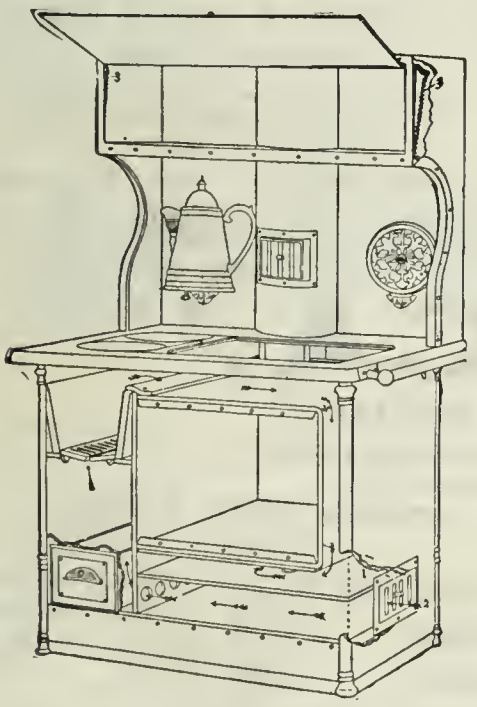

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Stoves were formerly considered luxuries. To-day people want something MORE SUBSTANTIAL and

The Champion and Marquart

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GET IN ON THE GROUND FLOOR AND PUT IN A LINE.

EASIEST SELLER YOU EVER SAW.

When once introduced will sell themselves.

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FREEPORT ILL.

—How to Lie In a Sleeper.—The following story, as told by Eli Perkins, has been going the rounds lately: "I rode one day on a train with Mr. Evarts. We were talking about riding on the Wagner, and I said: 'Now, Mr. Evarts, you have ridden a good deal on the sleeper, and how had a man better lie to sleep well? Head to the engine, or feet toward the engine?'

" 'Oh, you shouldn't come to a lawyer with such questions as that, Eli. That isn't a law question; that is an engineering question. You should go to some railroad president with such a question. Go and ask Depew.'

" 'But Depew is a lawyer, isn't he?' I said.

" 'Well, y—e—s! Depew is a lawyer;' then, continuing slowly and thoughtfully, 'but all the law Depew knows wouldn't bias him in answering any question.'

"When I told this story at the Lotos Club, a week afterward, Depew happened to be there. He laughed with the rest, but just before he left he leaned forward with his hand over his mouth and whispered to me:

" 'The story is all right, Eli; but if you won't tell it any more in New York I'll give you an annual on the road.' "

Mr. Depew's sequel to this story is that when Perkins came into his office and propounded the question to him he said:

"It would not make any difference to you, Eli, whether you were lying with your feet to the engine, or your head; you would lie just the same."

"See here!" howled the manager, "does it take you four hours to carry a message three streets away and return?"

"W'y," said the new office boy, "you told me to see how long it would take me to get there and back, and I done it."—*Tit-Bits.*

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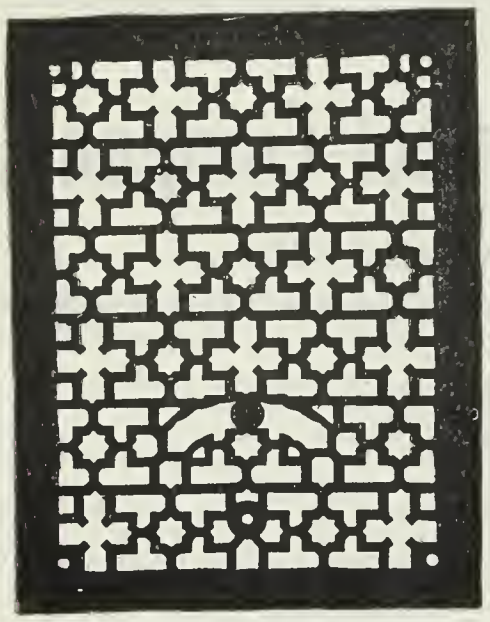

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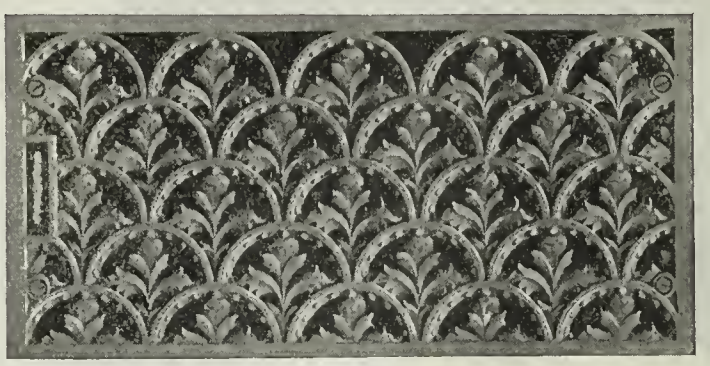

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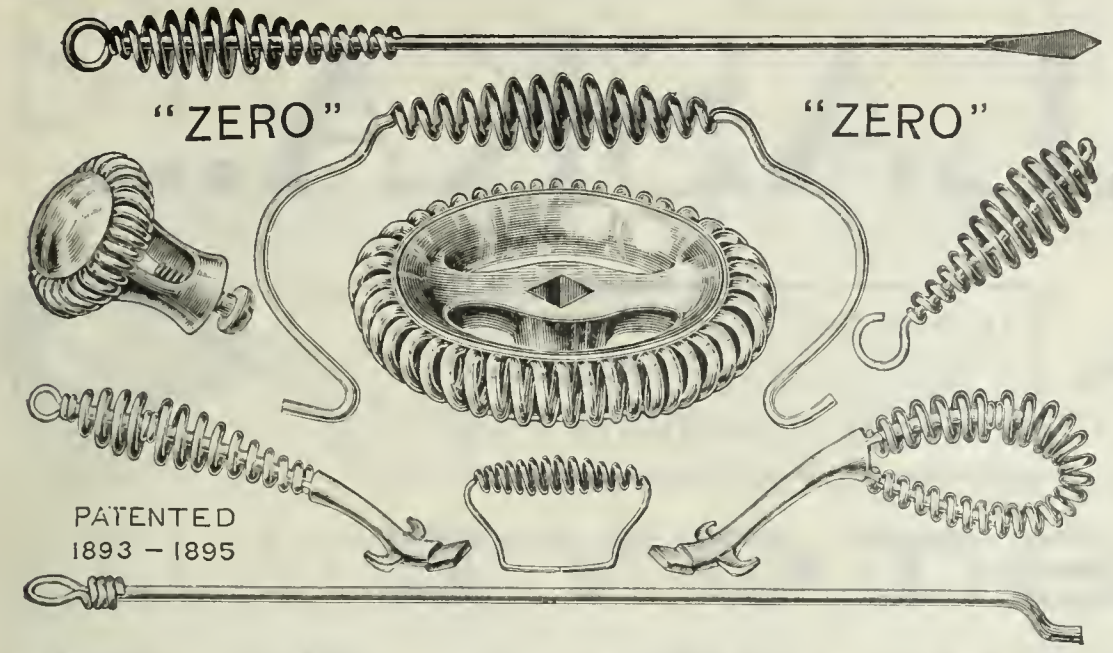

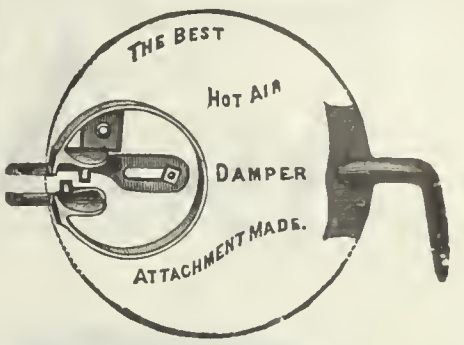

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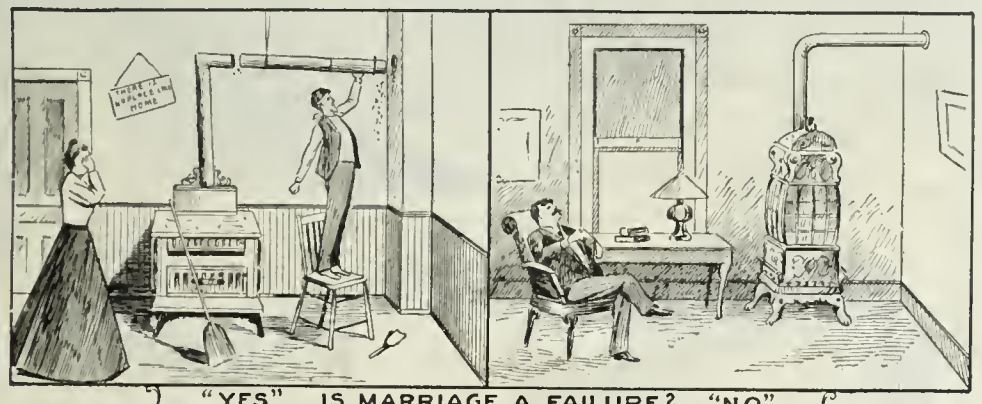

Locks both ways—from pushing in—from pulling out. You can order them from any of the following well-known jobbers:

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GREAT WESTERN STOVE CO., Leavenworth, Kans.
HILDEBRAND HDW. CO., Indianapolis, Ind.
GREER & LANG,
GEO. W. JOHNSON'S SONS, Wheeling, W. Va.
THE GEO. TRITCH HDW. CO., Denver Col.
HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ills.
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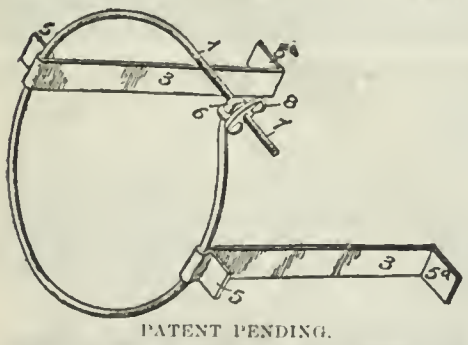

PATENT PENDING.

DIRECTIONS FOR USING.

Place the arms 3 in flue hole, leaving lugs 5 and ring 1 close to outside surface of chimney. Insert stovepipe as usual. As stovepipe enters flue hole, lug 5a catches on inner surface of chimney. Turn thumbnut 8 until ring 1 is tight around pipe. Push collar to accustomed place and the entire lock is out of sight.

Packed, 1 doz. in nicely labeled box.

Send in your orders at once. Set the pace rather than follow the other fellow. The cost is but a trifle.

No more cussing on account of stovepipe.

The jobbing trade supplied by

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Sole Mfr.,

Box B, Winfield, Kans.

—A BULL fight was recently given in the City of Mexico, in honor of the party of visiting American editors, and as a compliment to them the placards announcing the event were printed in what was thought to be English, as follows:

BUCARELI PLEACE OF DOWELS.

Greatest bull-baiting for the afternoon of Sunday 28 of February 1897th at 3 o'clock presily

There were beadering

6—BULLS FOR TO KILL—6

and one Spaniard of which was piked and put in beonderillyah three very good killers.

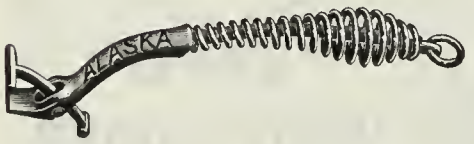
Very down prices.

Seen the programs.

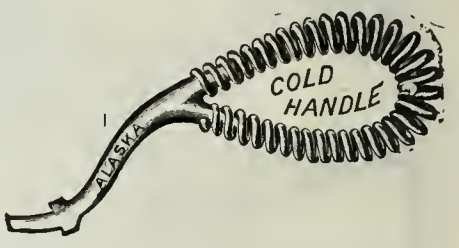
—*New York Tribune.*

—THE Philadelphia *Record* tells this story of a trade war. In order to boom business an enterprising grocer on a certain day advertised several thousand five-cent loaves of bread for sale at one cent each. His rival was in despair until a brilliant idea came into his head. He hired a small army of boys and girls to buy up all the loaves at a cent each. At 2 o'clock Grocer No. 1 had sold all his bread, and those who came later denounced him as a fraud, who had fooled them with a lying advertisement. Meanwhile the foxy grocer around the corner, with more than a thousand one-cent loaves stacked up on his kitchen floor, put out a big sign: "Fresh Bread—A Five-Cent Loaf for Two Cents. We Never Advertise What We Have Not Got." He thus not only discomfited his rival and turned the tide in his own favor, but made a profit on the bread as well.—*New York Tribune.*

...ALASKA...

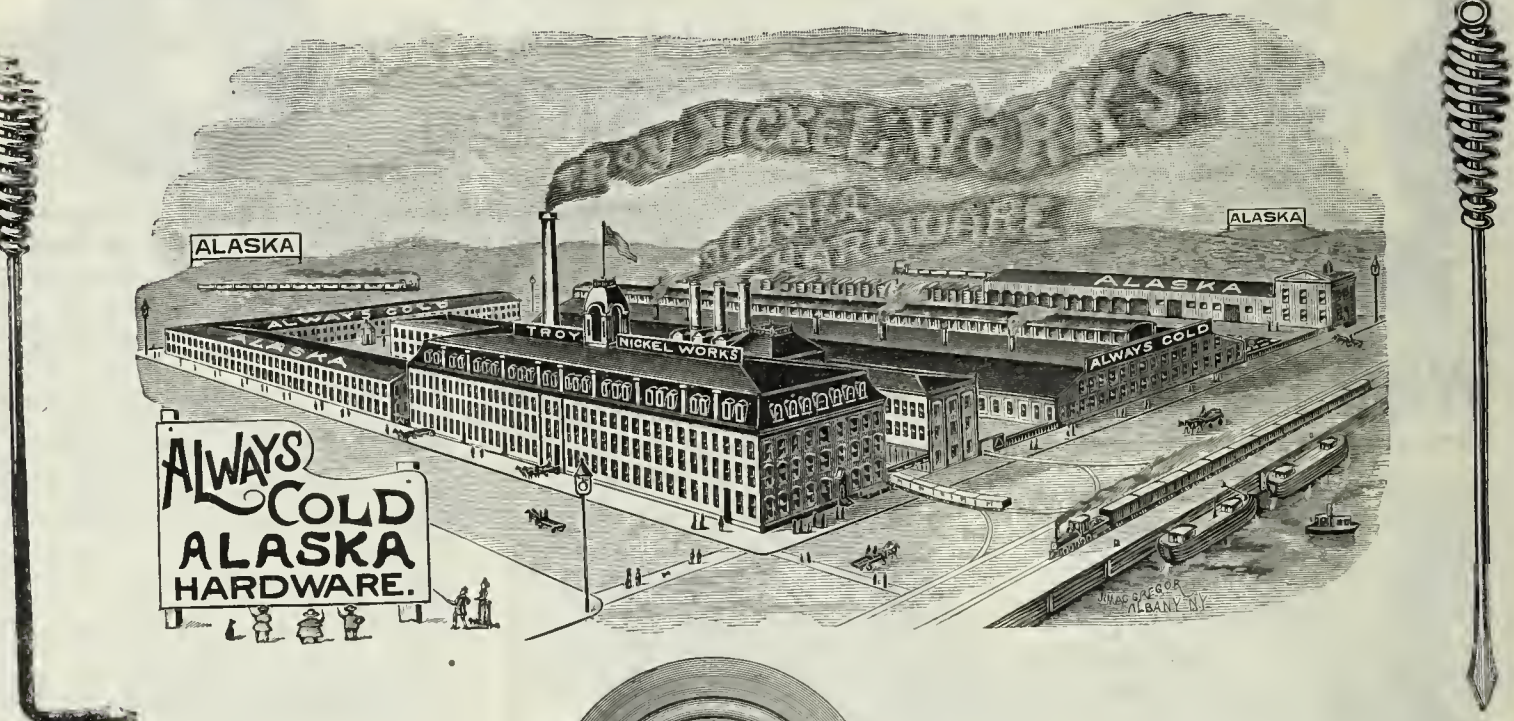


All good things are imitated.
Buy the original and
GET THE BEST.



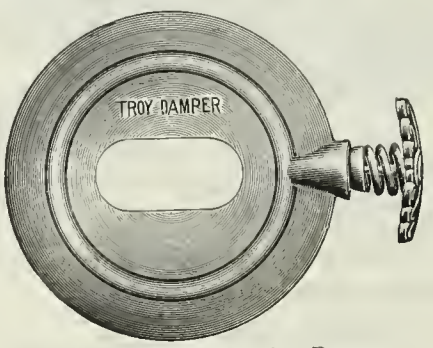
STOVE

Lid Lifters, Pokers, Shovels, Fire Sets.



PIPE

DAMPERS.



This is not as old as other Dampers, but it's getting there just the same, and re-orders proclaim the fact that it's liked by the users. Made in all sizes. "Handle Nickel Plated."

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TOWEL RODS.

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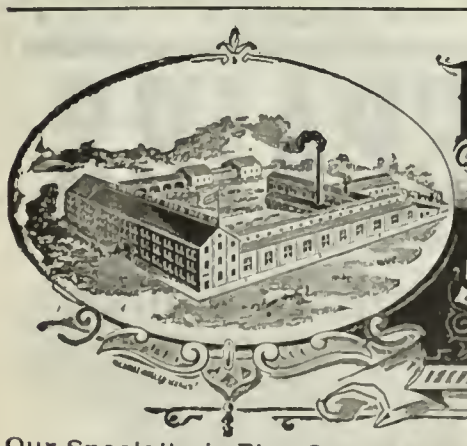

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"Here Nelson fell!"

"And no wonder!" exclaimed the old lady. "I nearly fell there myself."—*London Answers.*

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"Well, it would put the machine to a pretty good test if it was tried on some of my tenants," said Flatte, the landlord. —*Yonkers Statesman.*

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Try ☞
Will not Clinker.

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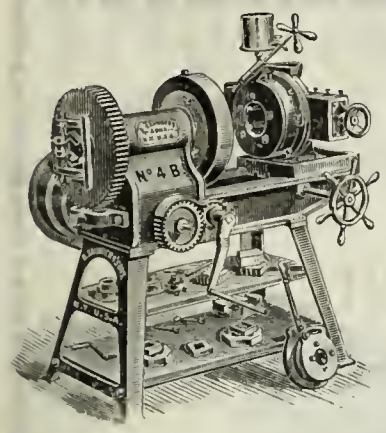

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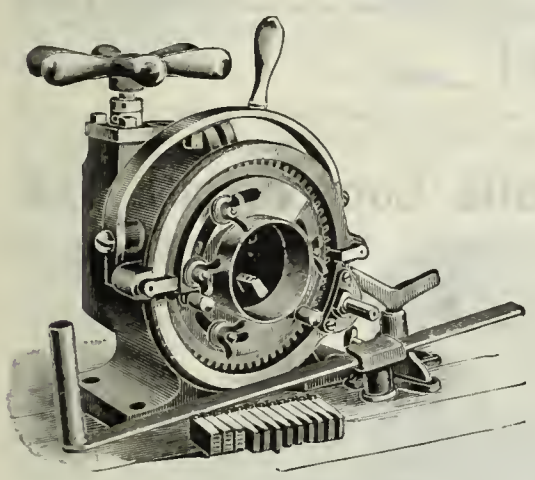

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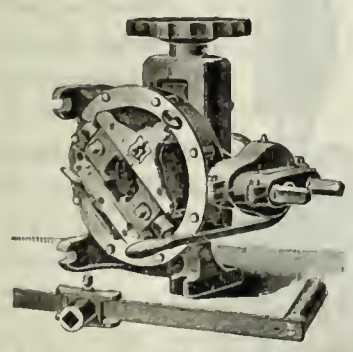

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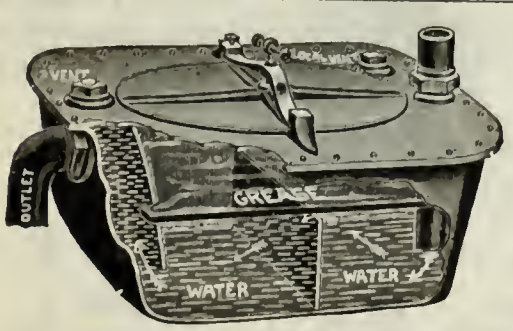

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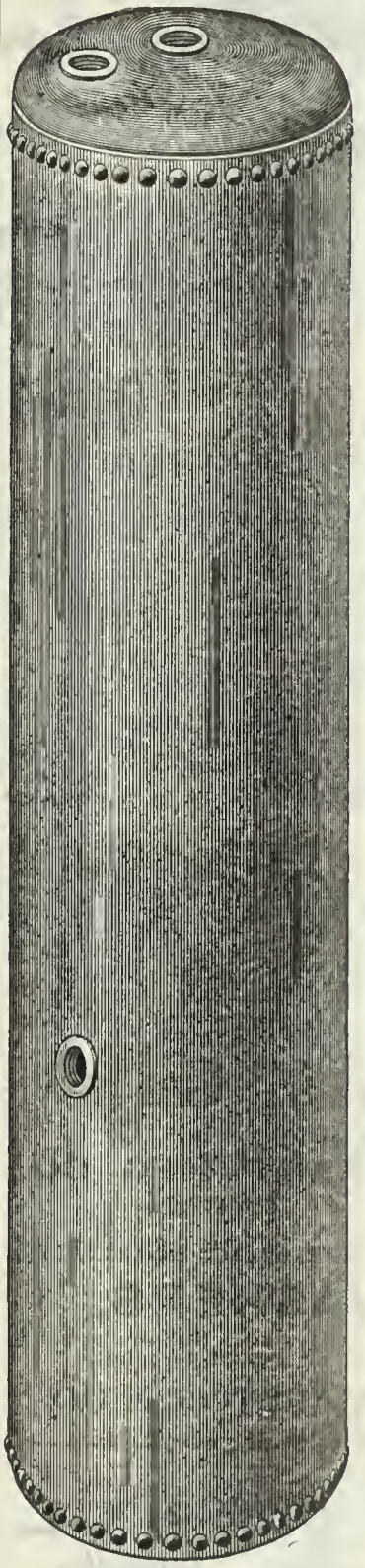


MANUFACTURERS OF

PLUMBING GOODS.

When Buying Boilers, ask for the "WOLFF" Boiler.

GALVANIZED RANGE BOILERS.

We operate a complete and extensive plant for the manufacture of Range Boilers, Expansion Tanks, etc. We do our own *Galvanizing*, make our own *Rivets*, and do the drawing-up work of the heads; our customers can therefore rely upon getting a first-class high grade Boiler. It is the best made. We make these Boilers in all sizes, from 18 to 192 gallons capacity; also Boilers with Galvanized Iron Steam Coils inside (horizontal and vertical), Boiler Hangers, Stands and Brackets.

Write for Illustrated Circular.

COLWELL LEAD CO.

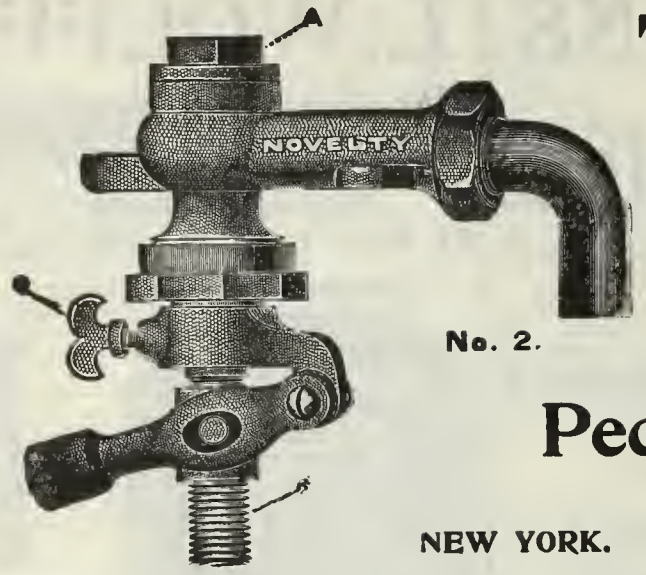
63 Centre Street, New York.

Manufacturers of

LEAD PIPE, SHEET LEAD, SHOT,

And Sellers of

Everything You Want for Plumbing.



No. 2.

The Novelty Ball Cock

(PATENTED).

Top Supply. Made also for Bottom Supply. Noiseless. For High or Low Pressure. Easily Repaired. Write for Prices.

MANUFACTURED ONLY BY

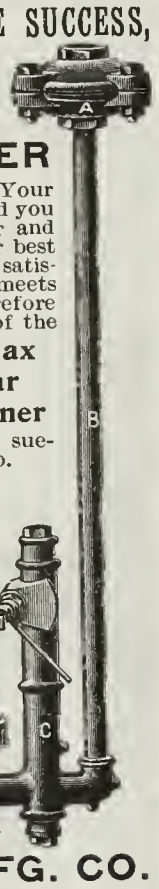
Peck Brothers & Co.,

NEW HAVEN, CONN.,

NEW YORK. BOSTON.

NOTHING SUCCEEDS LIKE SUCCESS,

henee the unqualified suceess others have cxperieneed with the



CLIMAX CELLAR DRAINER

should induce you to use it also. Your eustomers need This Drainer, and you should write to-day for circular and priees, because it is the Plumber best qualified to do intelligently and satisfaetorily all classes of work who meets with the greatest suceess and therefore the suecess of the

Climax Cellar Drainer

is your sueeess also.

Years of effort have euabled us to produce a Drainer of marvelous perfeetion, entirely free from stuffing boxes, springs, paekings and washers; a result not aeeomplished by any other manufaeturer.

The simplicity, reliability and superiority of the **Climax Cellar Drainer** are proverbial.

Sold by all Jobbers.

MANUFACTURED BY

C. M. KEMP MFG. CO.

BALTIMORE.

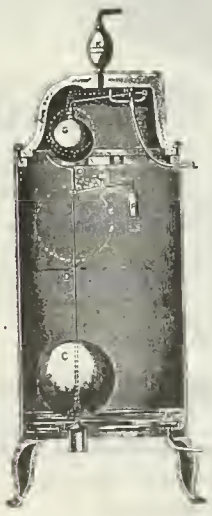
Leather and Rubber

WASHERS,

Machine cut, at less price than oan be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.



Patented Dec. 4, 1894.
Patented Oct. 15, 1895.

THE

I. X. L. Automatic Beer Pump.

Every Pump Guaranteed

Makes from 13 lbs. to 15 lbs. of air pressure in 4 minutes with one discharge of 10 galls. of water.

NOTHING TO GIVE OUT.

Muddy Water Don't Affect It.

The best, the most reliable, and the speediest pump on the market.

Very economical where water is supplied by meter system.

Send for a circular.

Agents wanted

THE I. X. L. BEER PUMP CO.

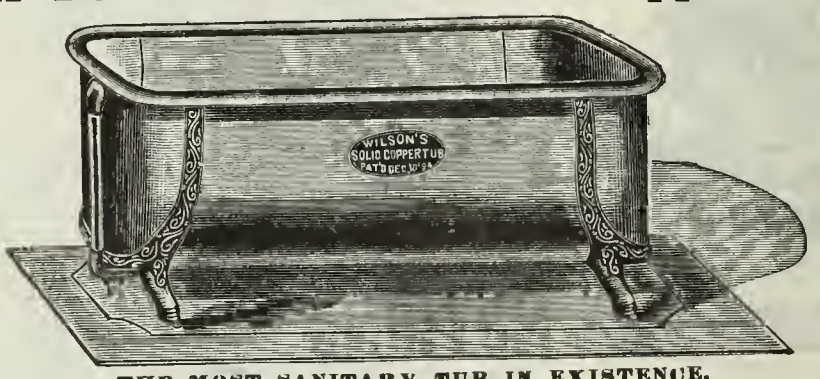
Sole Manufacturers,

1015 Christian St., PHILADELPHIA, PA.

TIME IS MONEY!

Therefore waste no more time in looking further when we have just what you want,

A Double Seamed Solid Copper Bath Tub,



THE MOST SANITARY TUB IN EXISTENCE.

The only one upon the market.

Send for illustrated Catalog of Bath Tubs, Tanks, Seats, Copper Range Boilers and Plumbers' Brass Work. Manufactured by

R. M. WILSON,

Rome, N. Y.

Plumbers' Slate Work.

Urinals, Laundry Tubs and all Kinds of Slate Goods.

SEND FOR PRICES.

COULMAN & WESTCOTT,

Fair Haven, Vermont.

New Style.

OUR PATENTED IMPROVED

Broughton Self-Closing Basin Cock.

No exposed working parts.

Every intelligent plumber will appreciate this.

The Broughton work has been in use many years.

Unsurpassed for strength and durability.

Every one warranted

Write for Circular and Price-List.

E. STEBBINS MFG. CO.,

Factory at Brightwood. SPRINGFIELD, MASS.

THE KELLY

Self-Acting Frost-Proof, After-Flush Closet.

For Extreme Cold Places and Out of Door Work.

When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

SEND FOR CATALOGUE.

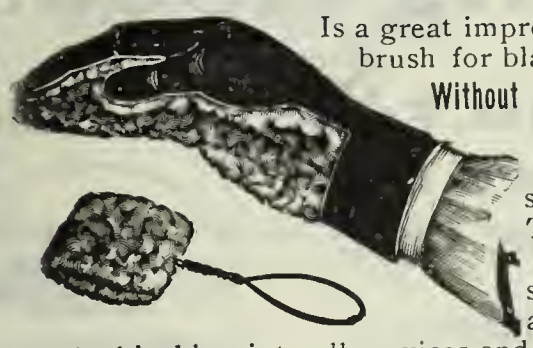
Thomas Kelly & Bro.,

201 Madison St., Chicago,

Manufacturers of Permanent Plumbing Goods.

Keep Your Hands Clean.

THE PARKS STOVE POLISHING MITTEN AND DAUBER



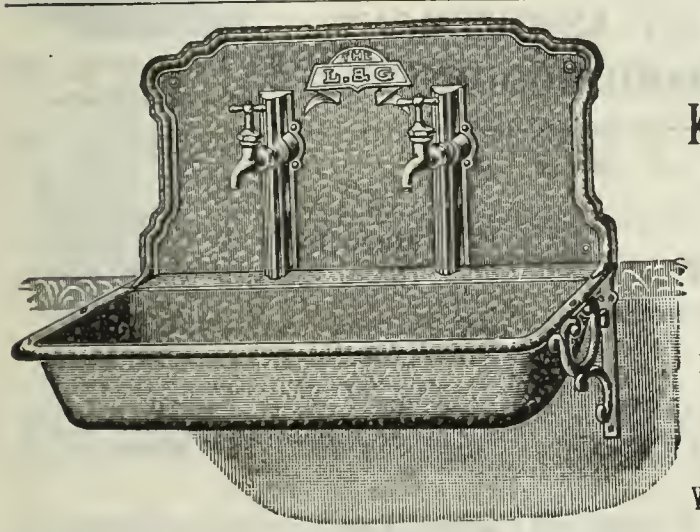
Is a great improvement over the old stove brush for blacking stoves.

Without getting a speck of blacking on hands.

The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth. **The Dauber** is also made of sheep skin, with the wool on, and so shaped as to readily get the blacking into all crevices and corners. It is also adapted to polish russet and patent leather shoes, cleaning windows, furniture, etc.

MANUFACTURED BY

PARKS & PARKS, - Troy, N. Y.



"L. & G."

Kitchen and Pantry

SINKS

AND

SINK BACKS,

Painted, Galvanized and Enameled.

Write for Illustrated Price-Lists.

LALANCE & GROSJEAN MFG. CO.

MANUFACTURERS,

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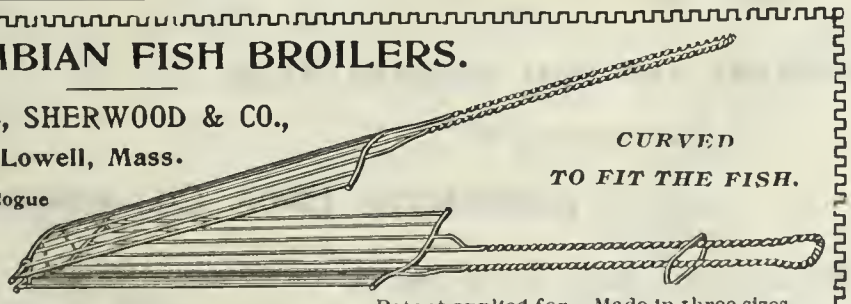
CHICAGO. *Branch Houses.* *BOSTON.*

COLUMBIAN FISH BROILERS.

WOODS, SHERWOOD & CO.,

Lowell, Mass.

Send for Catalogue of Wire Table and Kitchen Specialties.



CURVED TO FIT THE FISH.

Patent applied for. Made in three sizes.

Sperry's Steam Kettles.

Made from very thick metal, without Stay Bolts, Joint packed in such a manner as to never need repacking. A little higher-priced than some, but they are safe and tight.

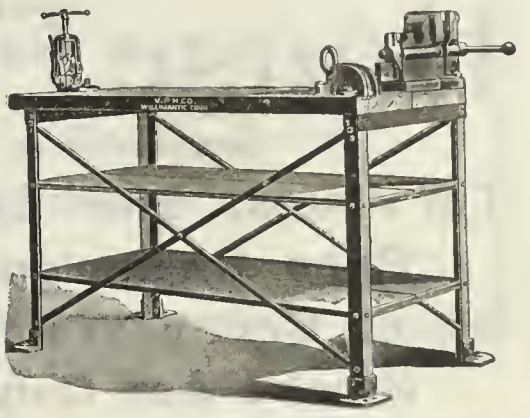
D. R. SPERRY & CO.,

HOLLOW-WARE FOUNDERS,

BATAVIA ILL.

VANDERMAN'S 1897 Specialties.

Send us your address, and in return we will send you a catalogue of the best line of specialties in the United States,



Consisting of

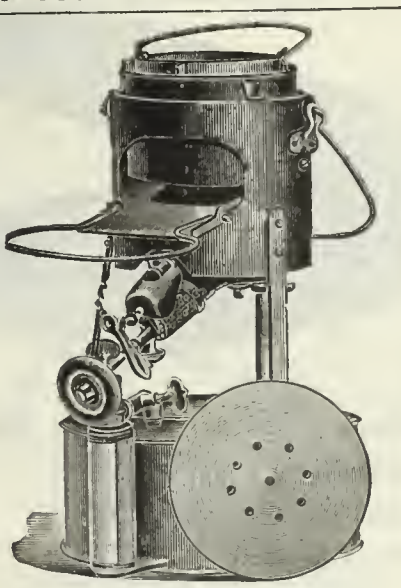
Steel tool chests, steel frame portable work bench, pipe bending form, leak stopper, cast iron pipe cutter, lead pipe cutter, asbestos joint runner, combination vise for holding brass and nickel plated pipe, combination portable shower bath, bath tub seat without metal parts combination bench and pipe vise, malleable iron hinged vise with bending forms, lead pipe bender, plumbers' pocket estimate book and other specialties.

Manufactured and for sale by

THE VANDERMAN PLUMBING & HEATING CO.,

WILLIAMANTIC, CONN.

No 2 BONANZA Combination Furnace



For Plumbers and Tinners.

Price $6.50 combination, including Lead Pot and casting. Price $6.00 for Plumbers alone. Galvanized iron tank with brass top; my patented rubber pump handle; a double burner, burns inward from both sides; hottest fire ever produced from gasoline; melts 10 pounds of lead in five minutes; heats 5-pound coppers in three minutes; cannot blow out. One dollar off cash with the order. Look out for "ad." of Bonanza No. 1 and No. 3. Write for catalogue.

M. L. HULL, Cleveland, O.

The KENNEY System of WATER CLOSETS

Are used in the largest and finest office buildings in New York. Among them are

THE BOWLING GREEN BUILDING,
N. Y. PRODUCE EXCHANGE,
STANDARD OIL BUILDING.

The Kenney Sanitary Mfg. Co.,

47 Dey Street, New York.

THE CENTRAL STAMPING COMPANY,

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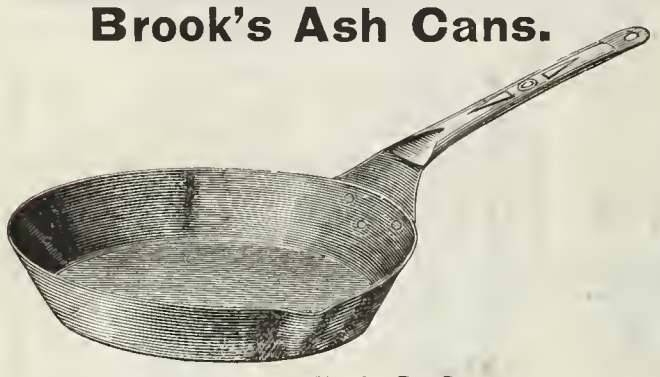
MANUFACTURERS OF

House Furnishing Goods

SPECIALTIES IN

Tin Wares, "Steel Edge" Dust Pans, Champion Flour Sieves, Central Watering Pots, Brook's Ash Cans.



Latest Style of Cold Handle Fry Pans.

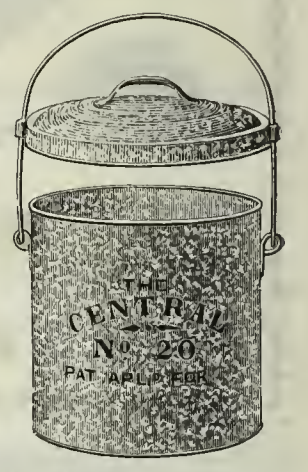
ARTICLES FOR

Kitchen, Farm, Dairy, Table, Factory, Lawn, Stable, Cafe.

New Price List,
Send for Copy.

Proposals Invited.

LARGEST ASSORTMENT.
STANDARD GOODS.

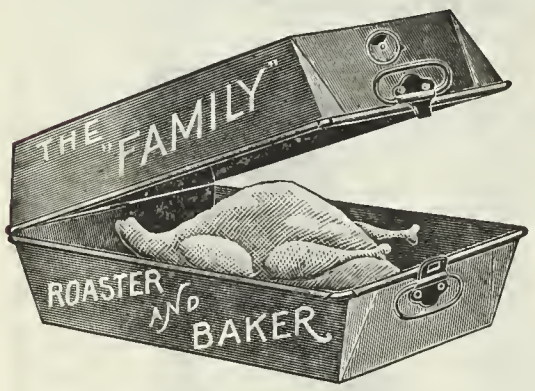


New Ash and Garbage Can.
Cover Always Attached.

We Wish to Introduce to You Our New

"Family" Roaster and Baker . . .

Made from Black Smooth Steel.



Nos.	10	20	30
Inches	8½ x 12½	10½ x 15½	12½ x 17½

The "Family" Roaster and Baker is a well made double roasting pan, the upper part of which is ventilated.

The two parts are joined by a hook hinge, and when closed are held securely together by this hinge in the back and a tongue in front, which slips through a slotted clip that is riveted to the lower part.

Include a sample lot in your next shipment.

THE SIMPLEST AND BEST ROASTER MADE.

MANUFACTURED BY

KIECKHEFER BROS. CO., Milwaukee.

Sold by all Jobbers.

STAMPED, JAPANNED AND PIECED

WATER COOLERS,
SPRINKLERS,
GALVANIZED
IRON WARE,

TIN WARE

GENUINE
DOVER STAMPING CO.'S
EGG BEATERS
AND A FULL LINE OF

KITCHEN FURNISHING GOODS.

DOVER STAMPING CO., Boston, Mass., U.S.A.

St. Louis Stamping Co.,

ST. LOUIS, MO.

—MANUFACTURERS—

Granite Ironware AND Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: *NEW YORK.* *CHICAGO.* *BOSTON.*

ILLINOIS PURE ALUMINUM CO.,

LEMONT, ILL.,

Originators of Aluminum Stamped Ware and Manufacturers of the only complete line.

Catalogue with latest prices mailed upon application.
Representatives in all principal cities.

GOODS GUARANTEED.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the

Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces. **Length, 10 inches.** Can be sold in all seasons.

Write to Manufacturers for Prices.

WILLIAM VOGEL & BROS., Wythe Ave., Brooklyn, N. Y.

BATH-TUB SEAT.

SEAT FOR BATH TUB
THIS HURTS AND THE WATER SPLASHES THE FLOOR.
WHY DON'T YOU BUY A SEAT LIKE MINE
WITHOUT SEAT ATTACHMENT
WITH SEAT ATTACHMENT

Our Patent Detachable Galvanized Iron Bath-Tub Seat, in three sizes, will fit any galvanized wash tub. Seats are guaranteed to hold a weight of 300 pounds. Tub and Seat complete retails at $1.50, with 50 per cent. profit for the dealer.

The legs fold and seats are shipped nested in boxes, not less than half dozen to a box.

H. WETTER MANUFACTURING CO., MEMPHIS, TENN.,
SOLE MANUFACTURERS.

HILL'S CHAMPION COOKER

A Steamless and Odorless Cooker with an Iron Base. Keeps the steam and odor from the house.

125,000 NOW IN USE.

SEND FOR CIRCULAR AND PRICES.

HILL-WHITNEY ALUMINUM CO.,
BOSTON, MASS.

ROME

TEA KETTLES, RANGE KETTLES, TEA AND COFFEE POTS, WASH BOILERS, STOVE TANKS, &C.,

ARE MADE BY

Rome Manufacturing Co.,

ROME, N. Y.

Write for Catalogue and Prices.

ROME MEANS PERFECTION.

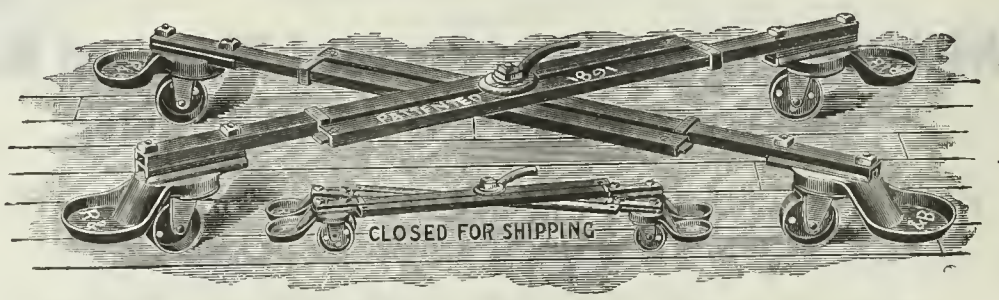
800 Series. Tin Lined.

900 Series. Silver Lined.

OUT OF SIGHT!

The only Stove Truck that does not show under a stove or range or raise them high from the floor.

It is literally out of sight, and consequently does not detract from the appearance of the stove or range upon it or make them look awkward or ungainly, as all other trucks do.



We will send one or more on trial for a month and take them back if not satisfactory.

THE S. M. HOWES CO.

40=46 Union Street,

BOSTON, MASS.

PRICE,

$16 Per Dozen.

PATENT

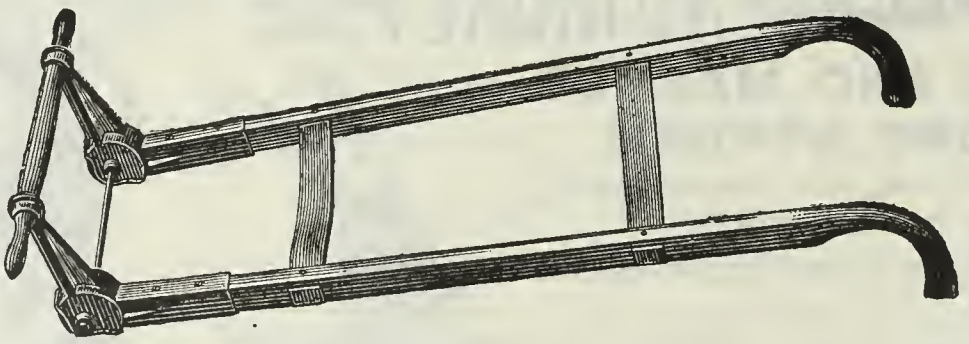
Stove Truck

AND

Carrier

MADE IN THE BEST MANNER

SEND FOR PRICE.



MANUFACTURED BY

C. S. Mersick & Co.,

NEW HAVEN, CT.

HANDLED BY ALL LEADING JOBBERS.

—Real Scotch Banter.—Charles A. Cooper says that when he was on the staff of the Scotsman he one day went to the room of his chief, Alexander Russel. As he opened the door the light must have struck strongly upon his hair, fast turning gray. Mr. Russel, who was bald, put up his glasses and exclaimed:

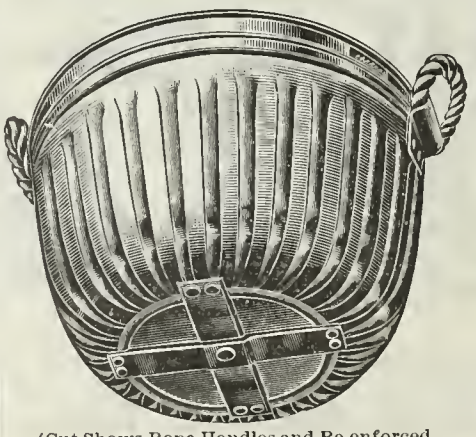
"Man, Cooper, how white you're getting!"

Cooper passed his fingers through his hair and replied:

"At any rate, there's plenty of it."

"Oh," came the retort, "mine preferred death to dishonor!"

—I won't stay long," ejaculated the six-footer, as he was about to have both legs amputated.—*Exchange.*



(Cut Shows Rope Handles and Re-enforced Bottom.) PATENTED 1896

Corrugated Galvanized Iron Basket.

Corrugated in such manner as to STIFFEN and STRENGTHEN it in Every Direction.

Making it the STRONGEST and MOST DURABLE Basket Known.

Made in any Shape, Size or Style to suit your wants.

Will send sample (1 bushel size) prepaid on receipt of $1.00. Write for our prices.

MANUFACTURED BY

THE METALLIC BASKET CO.,

123 South First St., Cedar Rapids, Iowa.

HE SELLS THE "WAGNER"

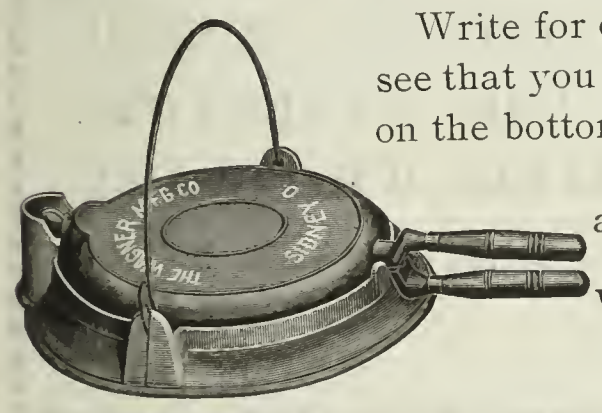
WAFFLE IRONS

And "Wagner" Iron and Nickel Plated Hollow Ware, the Highest Grade in the market.

Since the "Wagner" Waffle Iron has been put upon the market delicious waffles may be had without any more labor than is required to make griddle cakes of any description. They are conveniently operated and cleaned, as the pans separate at the hinge. This feature is entirely original in the "Wagner" Waffle Iron and is fully protected by patents. They are highly endorsed by Mrs. S. T. Rorer, Principal of the Philadelphia Cooking School, and many other demonstrators in cookery. We have customers that retail over ONE THOUSAND Waffle Irons per year.

This man does not.

Write for copy of our new catalogue. Always see that you get ware with the name "Wagner" on the bottom.



Ware sold from this market under any other name is not our make.

Wagner Manufacturing Co.,

31 to 61 Stone St., Sidney, Ohio.

EVERY HARDWARE MERCHANT

will find valuable suggestions for the advantageous arrangement and display of hardware in

The American Hardware Store,

By R. R. WILLIAMS, Hardware Editor of *The Iron Age*. 450 Pages. 500 Illustrations. Price, $3.00.

SUMMARY OF CONTENTS.

General Arrangement.	Locks and Door Trimmings.
Office.	Sandpaper.
Shelving.	Screen Wire Cloth.
Galleries.	Wire.
Elevators and Cranes.	Files.
Show Windows.	Horseshoes.
Counters.	Chains.
Counter Showcases.	Belting.
Upright Showcases.	Rope.
Ceiling Arrangement.	Handles.
Sampling Goods.	Sleds.
Signs in the Store.	Scale Beams.
Pillars for Displaying Goods.	Farm Bells.
Scales.	Malleable Fittings, etc.
Roll Paper.	Pumps.
Nails.	Pipe and Tubing.
Farm and Garden Tools.	Axles.
Scythes.	Glass Racks.
Bolts, Screws, etc.	Glass Cutting Tables.
Crosscut Saws.	Paints and Colors.
Hand Saws.	Oils, Turpentine and Varnish.
Edge Tools.	Brushes.
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Squares.	Seeds.
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Axes and Hatchets.	Lamps.
Cutlery.	Stoves.
Sporting Goods.	Iron and Steel.

THIS volume has been compiled from the extended series of articles in *The Iron Age*, on the arrangement of Hardware Stores, and contains a large and varied mass of information in regard to store arrangement.

A chapter is devoted to each subject and all are fully illustrated.

The summary of contents will convey an idea of the wide scope of the work, which treats of almost every subject connected with the arrangement of Hardware Stores.

Every hardware merchant should have a copy.

DAVID WILLIAMS COMPANY, Publishers,
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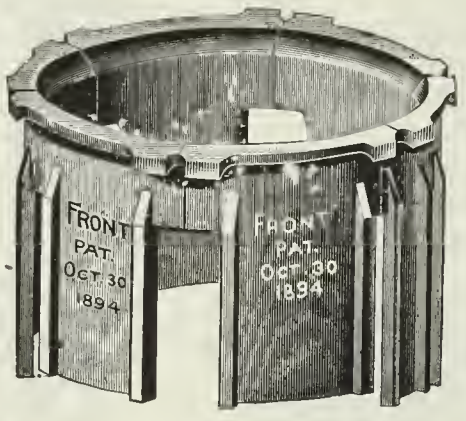
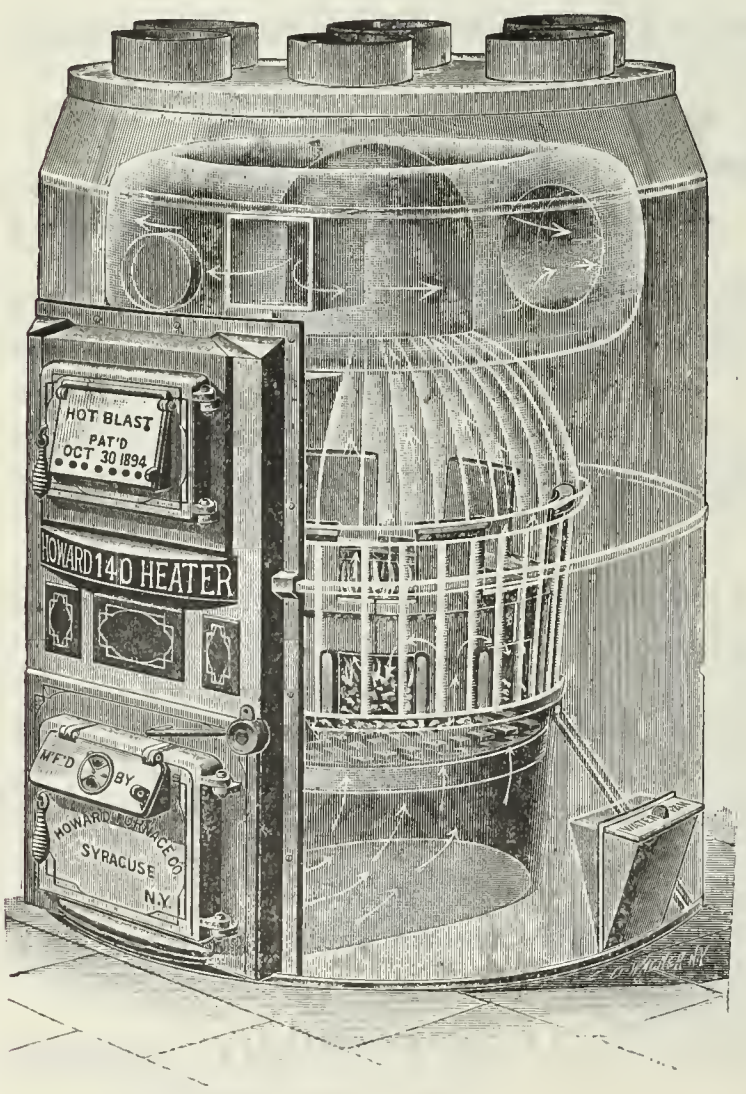
HOWARD FURNACES

For Burning Soft Coal



THE HOWARD HEATERS ARE PROVIDED WITH A HOT-AIR BLAST ATTACHMENT, WHICH DESERVES THE ATTENTION OF ALL DEALERS WHO WANT TO SELL A FIRST CLASS FURNACE.



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AND SECURE AGENCY.

HOWARD FURNACE COMPANY.

MAIN OFFICE AND WORKS, } **Syracuse, N. Y.**

BRANCHES:

NEW YORK,
231 Water Street.

BOSTON,
198 Spruce St. (Chelsea).

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 2, 1897.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

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PITTSBURGH.....Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Commercial Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon Street, London, England

Volume XLVIII.....No. 14.
Index to Reading Matter.....Page 84.

The Business Situation.

The third quarter of 1897, just closed, will be written down in trade annals as an era of pronounced revival. Business, which was hopefully recovering three months ago from the maladies which had sapped its vitality during nearly four years of depression, has renewed its strength to an extraordinary degree. The tonic of restored confidence has stimulated commercial and industrial activity all along the line and the opening of the last quarter of the year sees the trade of the country fairly launched on a new career of prosperity. Falling prices, disheartening competition, production running far ahead of consumption, and profits shrinking to the vanishing point—all the untoward features which made the last few years so burdensome to business men are happily becoming things of the past. A spirit of cheerful confidence has taken the place so long occupied by uncertainty and pessimism. The great agricultural community is blessed by bountiful crops, which the farmers are able to sell at profitable prices, and the good money which is flowing into their pockets is gradually finding its way again into the accustomed channels of trade. The expanding consumptive demand for manufactured goods of all kinds is reflected in renewed activity among mills and factories, which means more wages to an increasing body of workers who, in turn, are spending their money with greater freedom in various directions to the profit of trade in general. The railways are making up in a vastly increased freight business for their former losses, and are investing their growing earnings largely in improvements, repairs and renewals, thus throwing a heavy business to the iron and steel mills and in other directions, all of which entails a material swelling in the ranks of employed labor. The improvement, so far, has reached its highest development in the States west of the Mississippi, where the agricultural interests are the strongest. But it is also quite marked in the Eastern and Central States and in the South, except where the yellow fever outbreak has imposed a check on business lately. Prices are tending upward in an increasing number of lines. In several cases they are substantially higher. Production has fallen in the rear of the consumptive demand in a number of instances, notwithstanding that the manufacturing capacity is being pushed to its utmost degree to fill orders. The aggregate of bank clearings in the United States, a very reliable gauge of the volume of business, has for several weeks past reached totals of from $1,100,000,000 to $1,400,000,000, showing a gain of 50 to 60 per cent. over the figures of a year ago, and being 15 to 18 per cent. heavier than the totals for 1892, the last previous year of real trade activity. Exports continue unusually heavy, both in agricultural and manufactured products, and the foreign trade balance is steadily rolling up in our favor to unprecedentedly large proportions. In short, the last quarter of the year opens with the brightest outlook that the business world has been privileged to see for years past. At the moment there is a kind of "between seasons" lull in trade, but merchants and manufacturers generally are cheerfully preparing for an unusually brisk winter and spring campaign.

A Nut Cracked.

A hard question was asked last winter which is now being answered. When it was asked, those who propounded it were of the opinion that a long time would elapse before a satisfactory solution should present itself. The cause of our great prosperity in the past was traced to the enormous amount of money invested year after year for practically a generation in railroad building, extensions and improvements, ranging from a hundred to even five hundred million dollars per annum, and the question propounded was from what source are we to expect any great increase of wealth to the nation, to take the place even temporarily of the investment in railroad securities? An unexpected shortage in foreign crops and an abundant supply in this country have furnished the essentials for solving the problem. The foreign demand has proved a strong enough lever to lift us out of the rut of business depression, and if we are wise enough to use our good fortune with moderation we will be able to get along nicely in the years to come when the foreign demand will be light.

The Building Situation.

During the past sixty days indications of renewed prosperity and activity in the building trades throughout the country, which were more or less vague in the earlier season, have become crystallized actualities. The proportion of increase in the amount of money invested is larger through the Middle and Middle Western States than it is in the extreme East. It is estimated that the total amount invested in building during 1897 in the large cities of the East will exceed to a marked extent the amount invested during the previous year, but the proportion of increase seems to be greater in the West owing to the unusual dullness of business during 1896 in that section. Building is becoming more active as the season advances in the smaller cities throughout the country generally, a movement which is arousing hopeful anticipations, and is also manifesting itself in the cities of the extreme West and Rocky Mountain district. Very little disturbance has occurred during the past month between employers and workmen, the only strike of special significance being that of the cornice and skylight makers, which began on September 7 in New York and adjoining cities.

THE LETTER BOX.

Paint for Galvanized Iron.

From Manufacturer, Pennsylvania.—We notice the inquiry of "Tinner," Troy, Ohio, in *The Metal Worker* of September 25. The question he brings up is an important one, and while we have painted acres of galvanized iron we are unable to determine absolutely the best paint for the purpose. We have excellent results from the Nobrace, which is a carbon paint ground in oil, having wonderful covering qualities and adhering firmly. We have also used graphite paint for this purpose which was quite satisfactory, also red lead paints.

From a Bro. Chip, Jersey City, N. J.—Having read a letter from "Tinner," Troy, Ohio, complaining about paint not adhering to galvanized iron, cornices and roofing, would tell him we have had the same trouble, not only on galvanized iron work, but also on tin roofing. We have used paints of various manufactures, and also various kinds, and invariably with the same results. In some cases the paint would chip or crack, and in other cases the paint would evaporate so that hardly anything could be seen of it in a short time after its application, to the great annoyance of our customers and detriment of ourselves, as our customers would charge us with using poor materials. Now we believe that we have obviated all this difficulty by grinding and mixing our own paints, using the best mineral paints and oil that we can procure. Since we have done so we have had no trouble whatever, therefore we believe if "Tinner" of Troy, Ohio, will see that he has first-class paints to cover his work with he will have no trouble. Of course if "Tinner" persists in using the cheap concoctions sold as paint in the market he will have no end to his troubles.

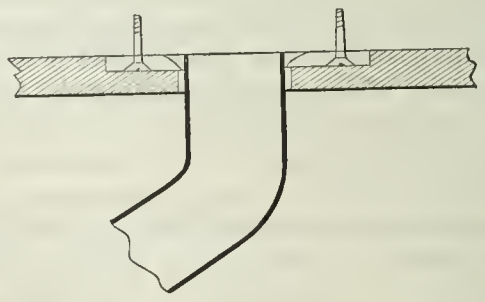
From Joseph Dixon Crucible Company, Jersey City, N. J.—On page 56 of *The Metal Worker* of September 25 you say that you would be glad to have those who are interested in the matter of painting on galvanized iron write to you about their experience, so that you may present them in the Letter Box. We have quite a large galvanized cornice on the street side of our pencil factory. It is 40 feet on the side street and 175 feet on the main street. When it was put up, about six years ago, it was painted with Dixon's silica graphite paint, and it has not been repainted since and it is in perfect condition. When the paint was applied the painter took care to note that the galvanized iron was free from any paraffin grease or oil, which is so often found on galvanized iron. Where it did appear to be at all oily or greasy that portion he washed with a weak solution of ordinary washing soda. Two good coats were applied and the job has been, as above shown, eminently satisfactory.

From N. Y. C.—I notice the inquiry from "Tinner," Troy, Ohio, in *The Metal Worker* of September 25, and I am not surprised at the complaint he makes. There is apparently something about the zinc coating that interferes with the sticking of the paint. The same trouble will be found with painting sheet zinc, but of course that complaint does not often arise, as there is comparatively little occasion for covering sheet zinc in this way. I have used iron oxide paint ground in oil, half raw and half boiled, and found that it gave very fair results. The complaint is sometimes made, where ready mixed paints are used, that the paints are adulterated with benzine or some such light fluid, which evaporates and leaves no body to stick to the sheet, and this is pretty bad with galvanized iron. Where a concern use a great deal of paint it is sometimes desirable for them to get their own paint grinding machine and mix the paints up for themselves. Of course a small user of paint could not afford to buy one of these grinders. I have also had fairly good results from the use of graphite paint. I doubt if your correspondent will have his question satisfactorily answered, as the difficulty, I am sure, lies in the material which he wishes to paint, which always has and always will give trouble.

Setting Siphon Jet Water Closet.

From T. R., Lowell, Mass.—When I first read the inquiry of "W. F. S.," in *The Metal Worker*, September 11, I thought that it was a rather simple job, not worth writing about; but when I reflected how I learned to do it I concluded to tell him what I knew about it. My knowledge was about the same as his at the start, because I had always been kept busy running lead service pipe. I read *The Metal Worker* and found in it at different times brief accounts of the latest practice and the objections raised against what was the general custom.

Assuming that one closet is to be placed in the bathroom of a private house, with only the bathroom fixtures



Setting Siphon Jet Water Closet.

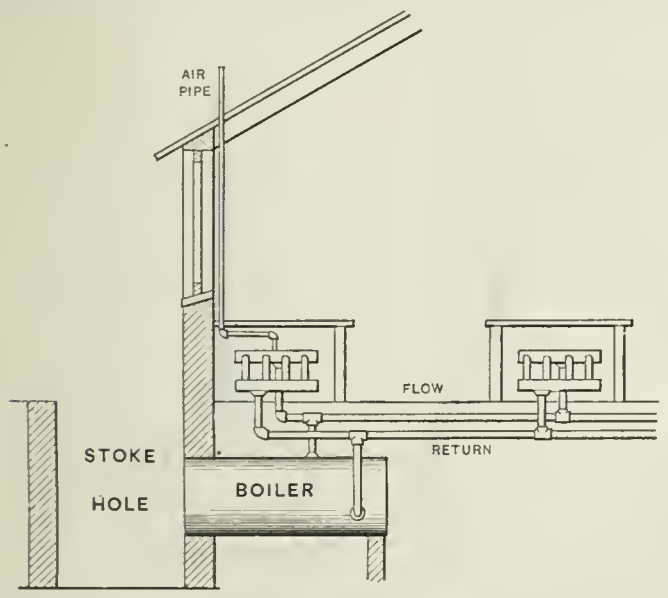
on that stack, the stack should be run up through the roof so that the part above the fixtures may be used for ventilating the traps. In selecting the Y which must be put in the stack to receive the closet waste, it must be decided whether the bath and lavatory waste are to be connected to a separate opening, as special Y's are now on the market adapted to this method, which represents the best practice. In determining just where this Y must be placed, the workman must know whether a marble slab is to be used under the closet, and if the bathroom floor is to be concreted or made of matched flooring, and also the depth of the joists. As there is a trap contained in the vitreous ware closets it is only necessary to provide a lead bend to connect the closet with the Y, but this connection is the most important part of the work, for if it leaks water and filth it is a nuisance, and worse yet if it leaks the filthy air of the house drains and possibly air from the sewer. No more need be said to show that this connection must be made with conscience as well as with the usual plumbing materials.

At one end of the lead bend a heavy brass ferrule should be connected by a stout wiped joint and then securely calked into the Y. At the other end of the bend a brass floor flange should be attached by a good soldered joint, as shown in the sketch, care being taken to thoroughly tin the bevel edge of the countersunk floor flange before attempting to do the soldering. Bolts are furnished for fastening the earthen part down tight to the flange. In order to make the joint tight some use a rubber gasket that is said to be pure, but it does not remain undefiled long if used. I prefer a good red lead putty, for it has the property of lasting indefinitely.

Owing to the trouble with broken vent horns on all earthen closets I prefer venting the trap by means of a branch at the lead bend. This takes an obstruction out of the bathroom, and if this branch is carefully made there is little danger of its being choked. The other end should be carried up to a sanitary T placed in the stack above the highest fixture. I like a rubber connection on the flush pipe, as then there is no danger of breaking the horn. Get dimensions of the closet from the dealer and measure the place where the work is to be done, so that a working drawing of the whole job can be put on paper in plan and elevation before the work is commenced, and I will guarantee that you will make a success of it on the first attempt. Then, after you are through, just be good and generous enough to tell how you got along, and criticise anything I have advised, for I won't feel bad.

A Greenhouse Heating System.

From W. M., Staten Island, N. Y.—With reference to the plan and cross section of a greenhouse showing system of heating about which "W. M. C.," San Jose, Cal., asks information in *The Metal Worker*, March 6, I would like to say that the system would, no doubt, work and probably give the desired results. There are, however, a number of changes in details that will make the



A Greenhouse Heating System.

system all right. The first of these is the position of the boiler, which should be sunk low enough to allow the main flow pipe to come out of the top of the boiler just below the level of the floor. Then one main flow pipe is sufficient, instead of three of them as shown on the plan which he furnished. The main flow pipe, and also the flow pipes which branch from it, should be laid with the rise as stated, and if the return pipes are laid parallel they will have the same fall back to the boiler, which is all that is required. The correspondent shows the air pipe discharging into the expansion tank; but this is unnecessary. As this is a low pressure system all that will be discharged from the air pipe will be air, and consequently had better be taken direct through the roof at an elevation above the expansion tank. There should be three air pipes, however, one from each of the three separate rows of piping which are shown on the plan. The air pipe should be taken from the highest point of the flow just before it becomes the return, as the air naturally rises to the highest point. An air cock will answer the same purpose, and it does away with the necessity of air pipes, but in my judgment the pipes are best.

As to the quantity of piping, the correspondent shows three rows of four flow and four return pipes each, which would make about 1440 feet of pipe. Now 1 lineal foot of 4-inch pipe, which is the usual size employed in low pressure heating, will heat 70 cubic feet of space to the desired temperature, and as 4-inch pipe offers two and a half times the radiating surface of 1¾-inch pipe, there would be required for this house abont 578 lineal feet o 1¾-inch pipe. Still it is well to have an ample margin so as not to force the boiler, and I think that just half the quantity shown by the correspondent would be amply sufficient. The inclosed sketch which I send shows how I would arrange the boiler and pipes. If the correspondent desires any further particulars I shall be very glad to communicate them.

Pattern for a Two-Pronged Fork.

From A. S. R., De Kalb, Ill.—Please publish in *The Metal Worker* method for obtaining section on miter or joint line between two forks of a Y, or two-pronged fork, so I may obtain the pattern by triangulation. I wish an accurate method that will apply in either of the inclosed sketches. The method published in the issue of March 28, 1896, shows only a freehand drawing for the intersection line, which I do not think is accurate.

Note.—We have not reproduced our correspondent's sketches, which show the intersection of two conical shaped forms, or rather a fork, the lower opening of which is a circle, and both of the branches opening at the outer ends in circles. Speaking roughly, the two pipes making the fork are cones, but our correspondent will understand that they cannot be true cones if they form a circle where they meet at the base. Therefore, being irregular forms, it is impossible to determine accurately what the miter line will be. The metal will have to be brought out of its true form of a cone to meet the miter. The only thing to do, therefore, is to proceed as was stated in the answer to the inquiry in *The Metal Worker* of March 28, 1896: "It is a question to be decided by the pattern cutter whether it is possible to draw this line arbitrarily in plan, and from it develop a section on the line B C, or to establish arbitrarily a section on the line C G similar to that shown at the right in $W^1 K^1 Z^1$. As this section must be established arbitrarily in one view or the other it can more satisfactorily be accomplished from the elevation than from the plan view."

What Commission for Selling Tinware?

From Tinware Salesman, Pennsylvania.—I shall be glad to learn from *The Metal Worker* or its readers what commission is paid for selling tinware to a salesman traveling through the country with a horse and buggy and defraying his own expenses. This method of selling goods has not entirely gone out of use, and I think it is employed with benefit in different sections of the United States, and I am desirous of learning what compensation could reasonably be expected.

Statistics of the lead and zinc production of the United States for 1896 have just been published by the Geological Survey. They show that lead mining was more active last year than at any former period, the output being ahead of the figures for 1891, the previous "banner year," by 10,000 tons. The total product of metallic lead in 1896 is given as 264,000 tons. Of this quantity, however, 78,000 tons were refined from foreign ores, leaving but 188,000 tons as the genuine American product. Manufactured lead of domestic production was exported last year to the value of $607,000, which is the highest figure ever reached in this branch of foreign trade. Spain is the only country that exceeds the United States in the matter of lead production, her output last year being 190 tons more than was produced here. Zinc production fell off from 89,000 tons in 1895 to 81,000 tons in 1896, this industry sharing in the general business depression to a larger extent than lead. Brass manufacturers were far from busy, and the galvanizing industry was dull, while sheet zinc did not call for normal requirements.

The annual report of Supervising Inspector-General of Steam Vessels Dumont shows that approximately 650,000,000 passengers were carried on steam vessels during the year, and that the number of accidents resulting in loss of life was only 26. The average annual loss of life during the past 20 years has decreased to a remarkable extent since the system of steam vessel inspection has been operative. Thus in 1851 it was one life to 156,006 passengers carried, whereas it has now sunk to the loss of only one life to each 1,882,845 passengers carried.

SHEET METAL WORK.

SLATE AND COPPER ROOFING ON FIRE PROOF BUILDINGS.—II.

BY WILLIAM NEUBECKER.

JOINING COPPER MOLDING TO STONE WORK.

Fig. 9 shows the method of fastening molding to stone work in a water tight manner, the molding forming a gutter under a mansard roof which is connected to a cast iron pipe on the inside of the building. A is the brick wall and B the stone coping, with a groove, C, cut into it the entire length of the molding. D represents ½-inch holes 1 inch deep, drilled into the coping at intervals of 2 or 3 feet. E is the molding with flange bent outward at F and set into the groove, which is filled with molten lead.

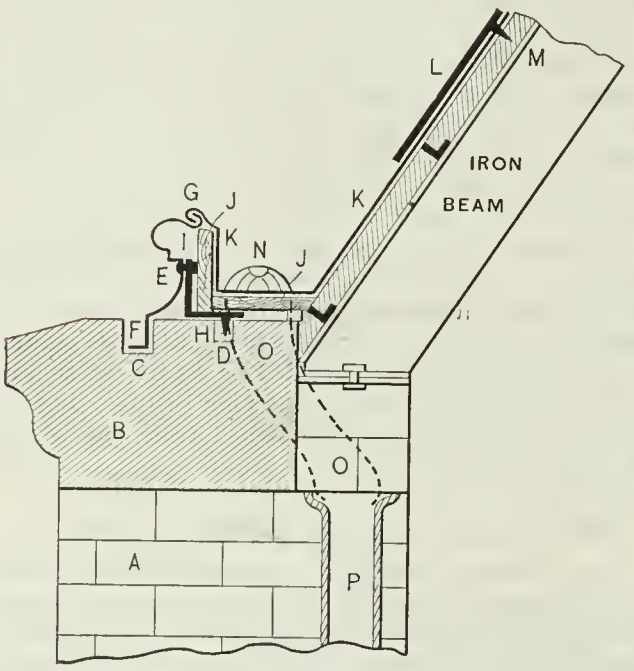


Fig. 9.—Method of Fastening Molding to Stone Work, Forming Gutter and Connecting Tube.

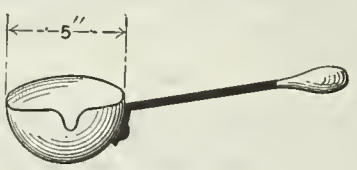


Fig. 10.—Ladle for Casting Lead.

The brass brace I I, which has been previously fastened to the copper molding by the brass bolt at E, is now fastened by means of brass nails into the drilled hole D in the stone, which has previously been plugged with lead.

The molding being set plumb, the gutter is then lined by the carpenter with planks J J, after which it is lined with sheet copper, locking the same into the lock G at the top and extending up against the porous terra cotta roof, as shown by K. Care should be taken to extend the copper lining high enough so that in case of an overflow the water will not flow behind the lining. Over this lining the slates L are laid and fastened to the terra cotta by means of brass nails. On some buildings the rain water is carried off by cast iron pipes, run up on the inside of the building in recesses left by the mason. P in Fig. 9 represents a cast iron pipe, put up by the plumber but connected by the roofer, by means of a 20-ounce copper tube, O O, connected with the copper gutter at the top with a copper strainer, N, and connected to the iron pipe P by means of a brass furrule soldered to the copper tube and calked to the iron pipe. Where the copper tubes pass through the stone or brick work it is usual for the stone-cutter or mason to make the necessary openings.

TOOLS REQUIRED FOR JOINING COPPER TO STONE.

A plumbers' furnace and pot are first required in which the lead is melted, and as it is important to pour as much molten lead into the stone groove as possible at one time a 5-inch ladle is usually employed of the shape shown in Fig. 10. After the groove has been filled with lead and has cooled it will be necessary to calk it well into the groove with calking chisels, the full size measurements of which are shown in Fig. 11. They are made of octagon steel and forged to the shape shown.

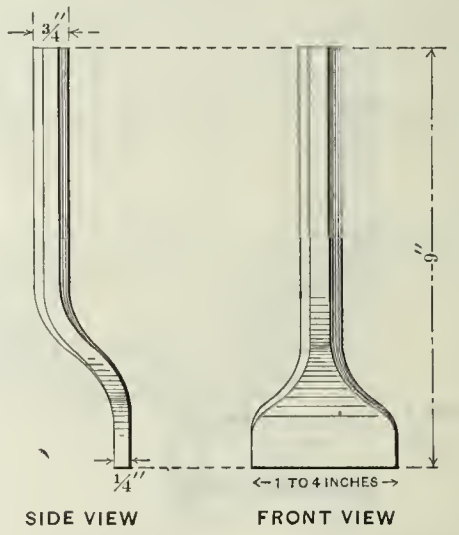


Fig. 11—Calking Chisel.

Fig. 13.—Soldering Copper Leader Inside.

CONNECTING TUBE TO ORNAMENTAL GARGOYLE.

Fig. 12 is a sectional view of a parapet wall, showing method of connecting tube to gargoyle and roof and obtaining water tight joint between the copper flashings and stone work and roof.

A is an iron column with shoulder upon which the iron roof beams rest, as shown at B. The columns are inclosed with stone and brick work and the space between roof beams is filled with brick arches. In this case a planked roof is laid, on which sheet copper is placed. C represents the wood furring, F the roof planks and D the copper covering, which is flashed up against the brick and stone work and made water tight into the groove H. In this case a square copper leader is to be placed on the outside of the building and secured to the stone work by ornamental hinged wrought copper hooks or holdfasts. For ornamental purposes a gargoyle is placed over and connected to the leader by means of tubes. K represents the copper tube connected at the top to the roof line D and flashing E, as shown, and at the bottom having a Y branch,

one branch connecting to the leader L and the other through the mouth of the gargoyle at M. A sheet metal stop, Y, is placed at the intersecting point of the Y branch, so that in case of a heavy rain the water rushing through the tube K will not overflow through the branch M while the leader is open. Should the leader, however, be frozen shut in the winter and the ice begin to thaw on the roof the water will overflow through the branch at N. A hinged strainer is shown at J, which is fastened to the flashing E and can be raised when desired for cleaning purposes. The leader L is fastened to the stone work in front with copper fasteners as before mentioned. The fasteners are placed about 8 feet apart and holes drilled into the stone work ½ inch in diameter by 2½ inches deep and plugged with lead; the hooks are then nailed in place by means of copper nails 2½ inches long with round heads.

CONSTRUCTION OF THE LEADER FASTENERS.

The leader fasteners are usually made from ¼ x 2½ inch band copper with an ornament at the ends, through the center of which a hole has been punched to admit the nail for fastening to wall. The construction of the hook is shown in Fig. 12. Let R represent the square leader projecting from the wall line S as much as shown. The hook is made of band copper as before mentioned in four pieces. The front is shown by X X hinged at one corner, the pin in the opposite corner being removable to allow the front to open and close. The two sides are separate;

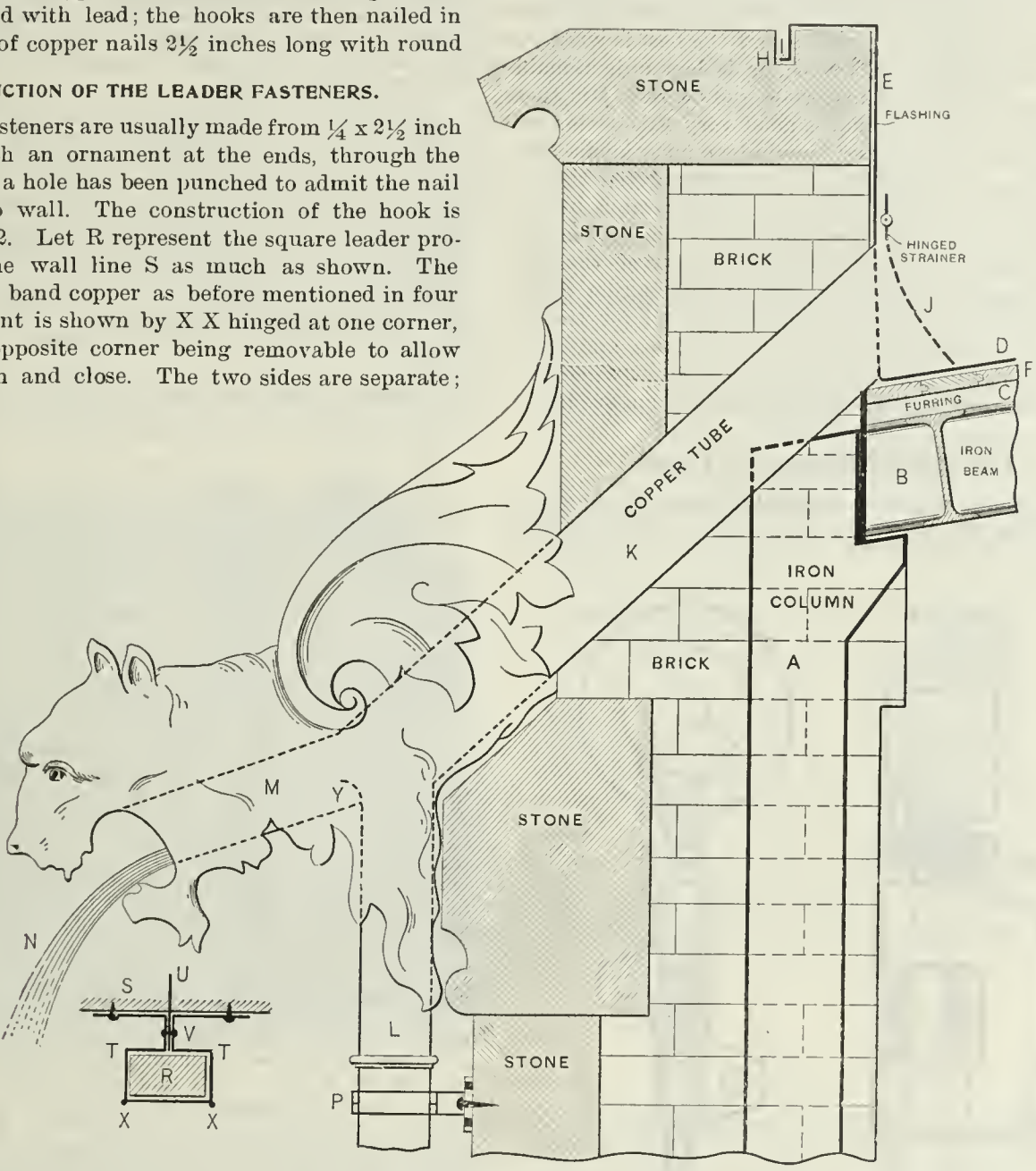


Fig. 12.—Sectional View of Parapet Wall, Showing Method of Connecting Tube to Gargoyle and Roof and Making Joint Between Flashing and Stone Work

the pin or wedge entering the wall shown at U is riveted to the two sides at V.

SOLDERING COPPER LEADER ON THE INSIDE.

When putting up copper leader on the outside of a building the seam should be clean, no solder showing. This can be done as shown in Fig. 13. A B C D represents a joint of round leader, D C being the seam at the bottom. Take small drops of solder and place inside of the leader, as shown by E E, &c., then by using a soldering copper with the handle slightly bent, as shown, the leader is easily soldered. The cross seams of the leader must be soldered outside and scraped or bronzed.

We are indebted to the Apollo Iron & Steel Company, Vandergrift, Pa., for a general plan for the town of Vandergrift. This model town, as our readers know, was laid in a bend of the Kiskiminetas River in Westmoreland County, Pa. The plan, drawn on a scale of 250 feet to the inch, shows the streets, parks and building lot divisions. Too much praise cannot be given the Apollo Iron & Steel Company for putting this work into the hands of such prominent landscape architects as Messrs. Olmstead, who laid out the land not only to good advantage from the industrial point of view, but so as to get the most beautiful effects for the town.

Painting and Repairing Roofs.

BY TWO NAIL CLEAT.

A roofer, particularly in the smaller cities, is compelled to do plumbing and sell stoves if he has any desire to amass, I was going to say wealth, but I guess I'll change it to a mass of pork and potatoes. This variety of trades is apt to keep him moving at this time of the year, but the way times have been he has had plenty, yes, a surfeit, of leisure to think and to scheme how he can make a few dollars. I guess I should have said a dollar and saved the few. This writing business is rather perplexing, for how can a man save the few when it is hard to make the solitary dollar?

To resume: He must let no chance pass, and to that end he should inform all who have roofs and gutters that there is no better time of the year than the fall to have them repaired and painted. A long winter, with its snows, sleets and freezes and thaws, is apt to try a roof and is sure to find the weak spots in one that needs attention. To repair a roof it takes a man with experience to look in the right place and it requires some skill to do the tinning on old rusty tin before the soldering is begun.

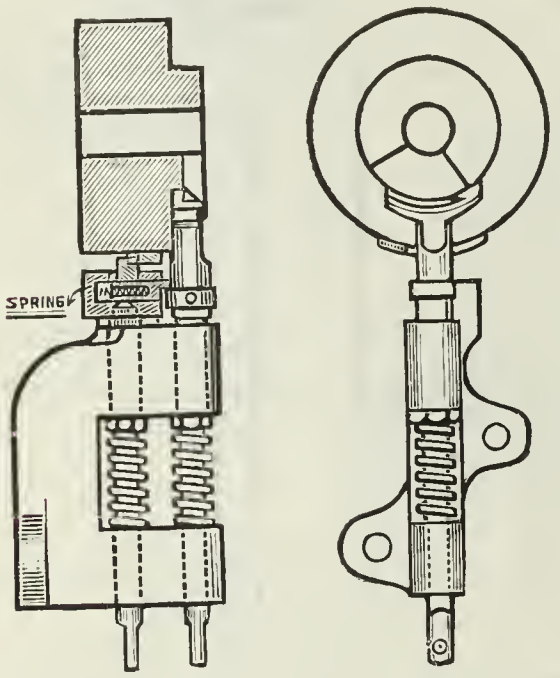
It is quite the fashion now to use acid for repair

soldering, and many men make no attempt to remove the acid after the soldering is done. The surplus acid should be wiped off with a wet sponge and a bucket of water should be handy for the purpose. I can get pay for this trouble with my old customers, to whom I have explained all about it. After the roof is attended to the gutter should be more carefully gone over, particularly if it is a box or valley gutter that might leak within the house wall. If it is a hanging gutter it should be lined up and have new straps where needed, and the spout head and leader should be looked over.

Then comes the painting, and the material used is of considerable importance. The best is none too good. Don't buy cottonseed or fish oil, but get good boiled linseed oil. Then don't take zinc white, but get good white lead; there are several qualities and the best is what you want. For coloring yellow ocher is less objectionable than some of the other materials and colors. Mix these properly, and if the weather is good very little drier will be needed, and what is used should be a good japan drier in preference to turpentine. I was first given this information by an old and highly esteemed painter, but did not profit by it; but a short time after another man of varied experience in outdoor painting gave me the same receipt, which I have tested to the satisfaction of my customers. Now is the time to paint roofs, for there is no hot sun to blister the paint before it dries, and if it is done now it will stand longer than if done when it is freezing weather or when the weather and sun are hot.

The Crosby Automatic Clutch.

The principal features of the Crosby automatic clutch for punching and drawing presses, &c., are shown in the accompanying illustrations The clutch in its original



The Crosby Automatic Clutch.

form has been in use for a long time. In order to keep pace with the times, however, the manufacturers have invented an improvement which will be appreciated by those having occasion to use it. The clutch is so arranged that, when desired, only one stroke of the mandrel or cross head can be made unless the operator removes the pressure of his foot from the treadle. In order to make a second stroke it is then necessary for the operator to apply another pressure to the treadle. The press, however, can be run continuously by changing the rod connecting the clutch haul off with the treadle to the other haul off stem, which requires but a moment to do. The clutch is made by G. A. Crosby & Co., 176 South Clinton street, Chicago.

A newly organized slate company, known as the Good Luck Slate Company, have begun operations in the Old Lehigh Tunnel quarry, Lower Slatington, Pa. This quarry has been lying idle for many years, although it is said the best slate in that section was there found. The new company are composed of F. J. Lentz, Owen Kern and Francis Remaly.

FLASHINGS.

An Englishman in reading a paper before an architectural association exhibited a photograph of a rain water leader that had been in service since it was put on the dining hall of Staples Inn, in 1655, and was reported to be in good condition to stand further service. The climate of London is said to be conducive to long service for lead leader and soil pipe.

The Bourlier Cornice & Roofing Company, Louisville, Ky., have secured the contract for the new train shed and annex for the L. & N. R. R., at Montgomery, Ala. There are over 600 squares of slate roofing, 175 squares of tin roofing and 18,000 square feet of skylights. The contract price is in the neighborhood of $20,000.

The Universal Machine Company, Canton, Ohio, are equipping some more well-known firms with their machinery for making single or double strength wire eave trough hangers. They have not yet got out illustrated circulars, but are prepared to equip firms with their machinery on short notice.

The roof of the new Spence Library of the Union Theological Seminary, at Richmond, Va., will be of fire proof construction. The trusses will be steel and the covering slate attached directly to metal supports. One end of the building is round, making a conical shape roof, and at various points of the roof slope are placed dormers and skylights. The peculiarity of the construction makes the iron work very intricate, in order to get the pleasing architectural appearance desired. The contract for furnishing and erecting the steel work for the roof has been given to the Berlin Iron Bridge Company of East Berlin, Conn.

We are advised that the report that the E. E. Souther Iron Company of St. Louis, Mo., had decided to establish a branch in Mexico is without foundation.

The cornice makers' strike in New York City and vicinity is responsible for a very decided falling off in the demand for roofing and cornice materials. Local dealers in this line complain that their city trade is suffering materially.

John Davies.

In *The Metal Worker* of last week we announced the death of John Davies of Brooklyn, N. Y., which occurred September 16. The following further particulars of his life will be read with interest: Mr. Davies was one of the oldest foundrymen in New York State, so far as length of service was concerned, he having spent nearly 60 years in that branch of trade. He was born in Clydach, Wales, August 17, 1833, where his father, George Davies, established the Bwllfa Foundry in 1828. The son took an interest in this line in his fifth year, and at the age of 12 was his father's head man, receiving full wages. He remained with his father until his seventeenth year, when he came to America and was employed by J. B. & J. M. Cornell, with whom he stayed three years. After severing his connection with this firm he spent the following eight years with John R. Pratt of New York and the North Brooklyn Iron Works, being foreman in both cases. He was then called to take charge of the foundry of Howell & Saxton, which was then starting, and his connection of 30 years with this concern as superintendent was a marked success. It was while here that he invented and introduced the manufacture of columns with green sand cores; also the hinged flask for heavy and light work, the core bar of perforated boiler plate, the truck and track and match plates, all of which improvements are now used by the largest house work foundries and serve to greatly reduce the cost of manufacture. Mr. Davies also made a number of improvements in steam engines. In 1890 he built and established with his son a house work foundry in South Brooklyn. Mr. Davies was well known in the heating trade, having for years made the castings for the Scollay boiler. During his business career he collected around him many friends in every branch of foundry work, to whom his death will prove a great loss.

The coroner's jury at Hazleton, Pa., which investigated the death on September 10 of the striking miners by the hands of the sheriff's deputies at Lattimer, rendered on Monday a verdict blaming the sheriff and stating that "the killing was unnecessary and could have been avoided without serious injury to either person or property," and finding that "the killing was wanton and unjustifiable."

The *Australasian Trade Review* reports that a Commercial Museum, on the lines of the museum at Philadelphia, is to be established at Melbourne. The object is to collect samples and information relating to local and foreign manufactures, and to make such available for commercial purposes.

HEATING AND PLUMBING.

The Sunray Boiler.

In the accompanying illustration we show the sections of the Sunray boiler, which is being put on the market by the J. L. Mott Iron Works, Beekman and Cliff streets, New York City. It is pointed out that there is ample space in the combustion chamber to promote combustion, and the flues are so arranged as to secure an indirect draft and a large fire surface. The construction is such that the headers are included in the boiler, which is of the slip nipple type. The inner surface of the fire box and combustion chamber is corrugated, increasing the surface presented, and the water sections form the bottom of the ash pit. The circulation of water in the boiler is controlled by means of a patented diaphragm placed in the steam dome of each section to produce a quick separation of the steam from the water and to prevent all danger of priming, ample steam space being provided in each section to preserve a steady water line under all conditions. It will be noted that only two nipples are required in each section, one at the top and one at the bottom, and that the bolts used for holding the sections together are all outside of the water passages, so that they are not subjected to the changes of temperature with the attendant expansion

The Sunray Boiler.

that would follow their immersion in the water passages. This latter provision reduces the possibility of leaks. The grate furnished is the lock shaking pattern, and so constructed that any grate bar may be taken out without disturbing the others. The boilers are made with two widths of grates, the first six sizes having a grate 20 inches wide and increasing 5 inches in length with each section, while the eight larger sizes have a grate 30 inches wide increasing 8 inches in length with each section, the grate in the smaller heater being 20 x 21 inches and increasing to 20 x 46 inches. In the larger size the smallest grate is 30 x 30 inches and increases to 30 x 78 inches. The smallest heater presents 48 square feet of heating surface, and increases 12 square feet in capacity with the addition of each section. The larger heater has 120 square feet of surface, increasing 30 feet with the addition of each section. These heaters are rated to carry from 275 to 2250 square feet of steam radiating surface and from 450 to 3800 square feet of direct hot water heating surface. The smaller series are tapped for 3 inch and the larger sizes have 4-inch flow and return mains. The hight of the water line in the smaller sizes is 42 inches and in the larger sizes 54 inches, the completed heaters standing respectively 54 and 66 inches high. The smallest heater of the small size weighs 1200 pounds and increases 230 pounds with the addition of each section, while the smallest heater of the large size weighs 3000 pounds and increases 600 pounds in weight with the addition of each section.

A New Radiator Catalogue.

A handsome example of the printer's art comes to us in the form of a catalogue from the Standard Radiator Company, who have offices in Buffalo, St. Louis, New York, Chicago and Boston. The catalogue consists of 42 pages of fine paper printed in two colors, and bound in embossed red paper covers bearing a design in gilt and the name of the company in embossed black letters. The last page has a monogram of the company. On opening the catalogue the various addresses of the company and the date 1897 appear. While an introductory note states that the catalogue contains useful information in reference to their manufacturing plants at Buffalo and St. Louis, a note states that radiation specified as "Buffalo Standard" is made at the Buffalo works only, and that radiation specified as "St. Louis Standard" is made at the St. Louis plant only, while "Standard" radiation is made at both. The first illustration is of the Buffalo Standard single column ornamental radiator for steam and hot water. The next pages show the Buffalo Standard single and three and four column plain surface radiators, followed by the Standard plain and ornamental radiator. The various styles of Buffalo Standard radiators are also shown ornamented. The company also point out that their radiators are made in all their various styles for both steam and hot water, the steam radiators having connection only at the bottom, while the hot water radiators are naturally connected both at the top and the bottom. An equally attractive variety is included in the line of St. Louis Standard radiators. The Empire is a new radiator, having solid end sections and of the two-column type. The pamphlet includes low radiators for windows, curve radiators for bow windows, circular radiators for columns and corner radiators for setting in the angle of a room. Some of the styles are also shown as direct-indirect radiators, and special cuts show the various tappings with which these radiators can be furnished. One page is devoted to a cut showing a radiator with special high legs and bearing the statement that they can be furnished in 6, 6½, 7, 8, 9 and 10 inch hights. Another page is devoted to the Standard indirect radiators, which can be furnished with various styles of tappings so as to reduce the labor of the steam fitter. The last illustration shows the Standard Quartette, including two styles of two-column radiators and a three and four column radiator. The last few pages are devoted to a telegraphic code. The catalogue presents the newest goods made by the company, and they are desirous of sending a copy to all who are engaged in the heating trade.

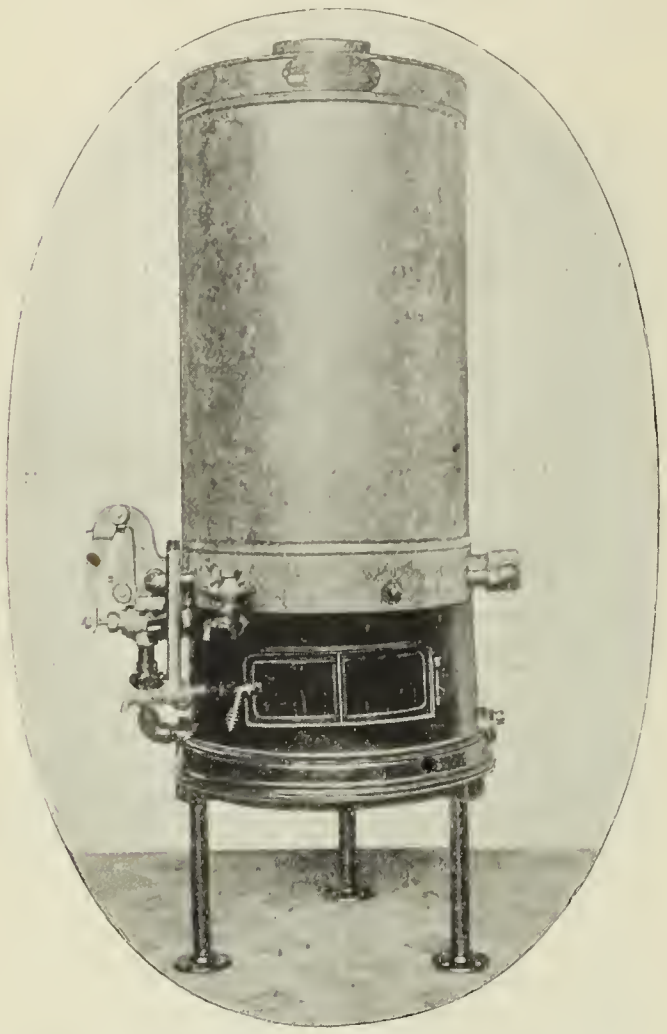
The Gem Boilers.

"High Grade Heaters for Modern Houses" is the title of a 36 page catalogue printed in two colors and bound in a linen covered board cover, issued by Johnson & Co., 84 John street, New York City. The first pages are devoted to the Little Gem, a heater which the contractor will find adapted to all kinds of small work and made in three different sizes. This is followed by the Gem heater, which has a larger capacity, and the Royal Gem, a heater of still larger capacity, all being made for both steam and hot water work. These heaters are all of the round form and horizontal sectional type, and some are arranged to secure an indirect draft. The Crown Gem heater, of the vertical sectional type of modern construction, is designed for large work. This is followed by the Economist, a sectional hot water heater designed for brick setting. The Economist steam heater is also designed for brick setting and is of the circular form of construction. The catalogue contains a price-list of a number of specialties used by the heating contractor, and in additional to testimonial letters and references has much to attract the buyer of such goods.

The Bridgeport Steam Heating Company, Bridgeport, Conn., have recently completed the Heating Apparatus in the factory of the American Graphophone Company, and have set a Gurney Hot Water Heater in the residence of P. J. Dewitts. They are installing Hot Water Heating Plants in the greenhouse of David Beach, and are using two Doric Steam Heaters in a system for C. Y. Beach, New Haven. They are also busy in their Plumbers' and Steam Fitters' Supply business.

The Ruud Instantaneous Automatic Water Heaters.

A problem which has been brought to the attention of the plumber within the past two or three years has been the supplying of hot water in residences and particularly apartment houses At first the demand was for supplying



The Ruud Instantaneous Automatic Water Heater.—Fig. 1.—*General View of Heater*

hot water during the summer season, but with the modern furnishings in buildings it is necessary to supply hot water in apartment houses throughout the year, as it has become customary to furnish heat for the entire building, including the kitchens in the various apartments, and in many instances the cooking in these kitchens is done entirely by gas.

In the accompanying illustrations we show the Ruud instantaneous automatic water heater and the thermostat used in connection with it, manufactured by the Ruud Mfg. Company, Pittsburgh, Pa. Fig. 1 is the water heater, which is designed to be placed in a basement and supply hot water for one family in a residence or several families in an apartment house. The heater is constructed so that it may be connected direct with the main house water supply. It contains several feet of copper tubing arranged in the form of a coil through which the water must pass before it is discharged hot to the different fixtures in the building. Underneath this copper heating coil is a gas burner which is kept burning until the water in the heating coil has reached a given temperature, when the thermostat shuts off the gas supply and there remains stored in the heater the amount of hot water which the coil contains.

A sectional view of the thermostat is shown in Fig. 2, a feature of which is that the hot water never comes in contact with any of the valve operating mechanism, so that it is not likely to corrode, and is said to last and operate satisfactorily for an indefinite period. By a study of the cut it will be noticed that a steel rod is inclosed in a water chamber formed by an inner and outer brass tube, and is connected with the rigid parts on the tube by means of hinged links which can be adjusted in their actions by adjusting screws. Connection with the water chamber in the brass tubes is made with the water in the heater coil, so that when the temperature falls below a desired point the contraction opens the gas supply to the main burners, which are set in operation by means of a pilot light which is connected with the gas supply independent of the burner and valves. By this arrangement hot water is at the service of the occupants of a building at any hour of the day, the thermostat operating automatically and independently at all times. The heaters are made to supply 1½, 2½, 4 and 8 gallons per minute at a temperature approximating 150 degrees, and the burners can be supplied for use with natural or artificial gas, and are said to be economical in their consumption. The company have prepared a catalogue showing their water heater used in connection with a circulating system in a building, and also in connection with a large hot water storage tank. These catalogues can be secured on application.

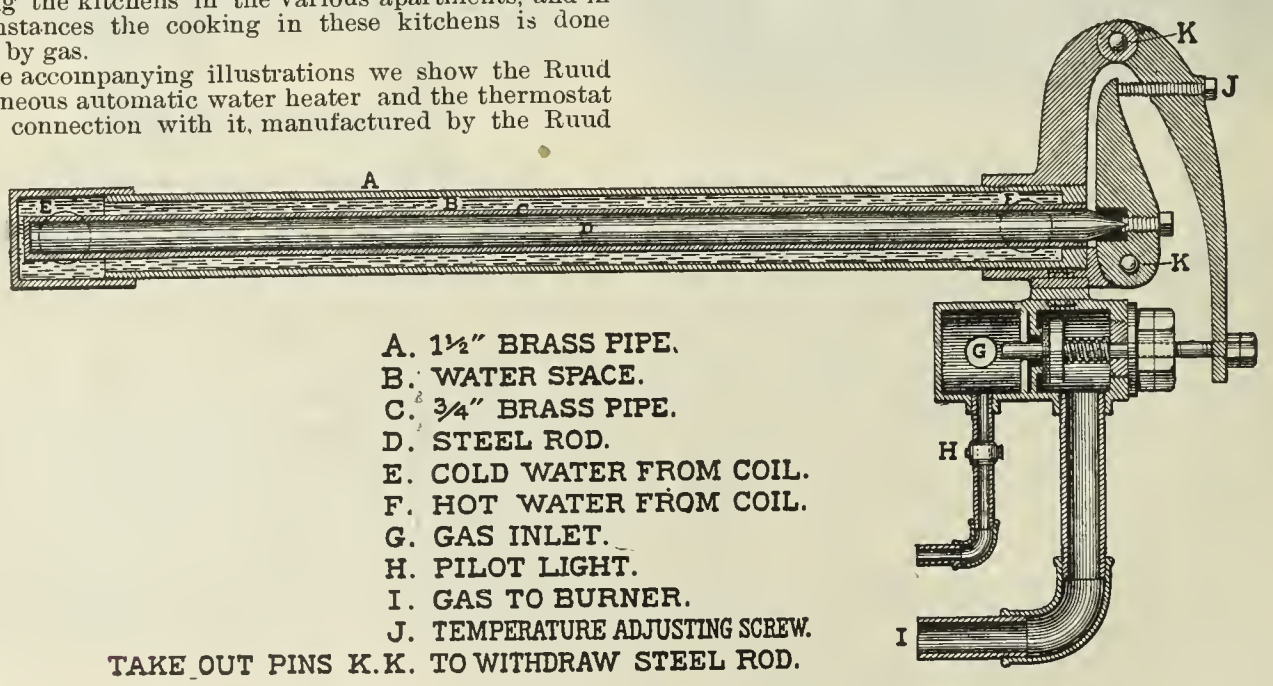


Fig. 2.—*Sectional View of Thermostat.*

Water Service Regulations of Fort Worth, Tex.

The following extracts are taken from the ordinance regulating the Forth Worth, Texas, Water Works, which contain information that may be of interest to those engaged in the plumbing business :

TAPPING OF MAINS.

Section 9. No plumber or other person, except the tapper employed by the Fort Worth City Water Works, or the city plumber, will be allowed to tap any street main. For domestic service in families of not over eight persons, ½-inch pipe ; for over eight persons and not exceeding 15 persons, ¾-inch pipe. Taps for larger pipes than the above by special agreement only.

STYLE OF WATER CLOSET.

Sec. 10. No permit will be granted for any style or make of water closet, except what is known as a tank closet, with self closing valve, or automatic flow from a tank. No stop or compression cock or continuous flow allowed for flushing water closets or urinals except through meters. In case of breakage of the bowl or hopper of any style of closet except the tank closet, the same shall be replaced with a tank closet, or privilege for city water for the same will not be allowed, and overpaid rent returned.

HOT WATER BOILERS.

Sec. 11. All boilers for heating water shall be provided with air valves to prevent collapsing when the water is

drawn off. Advise opening all hot water faucets to allow steam to escape, when the water is cut off.

PLUMBING FIXTURES.

Sec. 12. No joints on lead pipes but wipe or ball joints. No goose necks will be allowed on sidewalks. Sinks, wash stands, urinals or any other apparatus connected with the service where a continuous stream may flow must have self closing compression cocks. Special permits will be given for hose bibs. No hose bibs allowed unless parties pay for hose privileges.

PLUMBERS' RETURNS.

Sec. 13. Plumbers shall make full and complete returns of the use for which water is applied under any permit granted. Said returns must be made by the plumber doing the work within two days after the completion of said work, as the water will not be turned on any premises until after returns are made and the work reported to be in accordance with the rules and regulations herein described.

TURNING ON WATER.

Sec. 14. No plumber shall turn on or off water from the street stop cocks or allow any person in his employ to do so without a written permission from the Fort Worth City Water Works, except for repairs.

FOR VIOLATION OF RULES.

Sec. 15. Any plumber violating any of the rules and regulations governing the introduction, supply and consumption of water, or who shall voluntarily, or at the request of any consumer, introduce any hydrant, pipe, bath, water closet, urinal or any other device or fixture which is prohibited or which has not been permitted by the Fort Worth City Water Works, shall forfeit and pay to the city the sum of $100, which may be recovered on his bond, or by direct action, and in addition his license shall be forfeited and not be renewed nor he be allowed to do business either for himself or other plumbers, in connection with the water works, until after the expiration of 30 days, and until the payment of such fines.

STOP BOXES.

Sec. 16. Consumers shall cause to be placed at their own expense in his, her or their attachments in the sidewalk, and not exceeding 1 foot from the sidewalk curbstone, a stop cock and stop box, that shall be under the exclusive access and control of the city, and on any violation of the agreement on the part of the consumer the city will at once remove such service from the city pipes and refuse to again make such connection until the consumer shall pay all expense of removal and replacing, and give satisfactory security against violation. The street stop shall be what is known as "ground key work," with a T handle and nut and washer bottom, and the stop box shall be the iron screw extension box, with screw bolts to secure the top and to be unscrewed or opened with a socket wrench, and not defaced or opened in any other manner. The tops of said boxes must be kept closed and in repair by the consumer.

SEWER RATES AND PRESSURE REQUIRED.

Sec. 24. That all persons having upon their premises a water closet or privy with sewer connections shall pay the lawful rate for water closets, whether such closet or privy have attachments connected with the city pipes or not. That any person violating this ordinance shall be deemed guilty of a misdemeanor, and shall be fined before the judge of the city court not less than $5 nor more than $10 for each offense. This ordinance not to conflict with persons having an artesian well flowing into a tank, giving satisfactory pressure for flushing. Persons or corporations having artesian wells or any device for flowing water into a tank affording a pressure not less than 10 pounds to the square inch for flushing their closets, shall pay one-half the schedule water rates for water closets, or rates known as "Sewer Rates." That persons refusing to pay the said "Sewer Rates" shall be deemed guilty of a misdemeanor, and shall be fined before the city judge of the city court in a sum not less than $10 nor more than $50 for each offense.

[Note.—This ordinance is to protect the city against loss in the maintenance and flushing of sewers, which is not included in the ad valorem city tax to pay off the bonds for construction of sewers.]

OPTION TO SET METER.

Sec. 25. The City Water Works Department are authorized and empowered, when in their judgment the welfare of the city may demand, to have water which may be supplied to any consumer, whether corporation, firm or individual, and for whatever purposes supplied, measured by meter, and to have such meter so located in the building or vicinity as the water works superintendent may designate, and water shall not be furnished parties who fail to comply.

OWNERSHIP OF METERS.

Sec. 28. The city reserves the right to own and control all meters of 2 inches and under, it being necessary so they can be protected, kept in repair or exchanged during repairs. No meter over 2 inches in size will be furnished by the city unless by special agreement or contract. Consumers will be allowed to own meters over 2 inches in diameter, provided the same is under control of the city. Parties wishing meters shall enter into a contract to keep the meter until the expiration of the fiscal year.

CONNECTIONS OR TAPS.

Sec. 34. The owner of a group of houses fronting on any street where there is a water main shall be required to provide a separate pipe and distinct connection with the main for each of said houses, and shall also be required to have a good and substantial fence, without gate, steps or other communication, inclosing separately each house and yard, to prevent persons from one yard from obtaining water from the hydrant of another yard. Owners of store and office buildings will be required to pay for water for the entire building, unless there is a separate cut off for each floor, located at the sidewalk, and no permit issued for less than two cut offs for more than one-story business buildings.

All single residences or houses shall be required to have separate and distinct connections to the city mains, and separate stop cock, and whenever the Water Works Department shall find more than one single house supplied from one pipe (without special permission), they shall at once have the water turned off, and the same shall not be again turned on until separate connections are made, and under no circumstances shall there be more than one service connection made to any one house or premises without the knowledge and consent of the Water Works superintendent.

PLUMBERS' LICENSE—PLUMBERS' BOND.

Sec. 35. Any person intending to follow the business or occupation of plumber, in relation to or in any way connected with the City Water Works, its mains, pipes, fixtures, &c., shall, before undertaking any work in connection therewith, first apply to the Water Works Committee in writing for a license, which license shall not be granted by said committee unless the applicant submits to said committee the certificate of two plumbers in good standing, to be selected by the Water Works superintendent, or other evidence satisfactory to the superintendent that the applicant is thoroughly competent to do plumbing work.

If the said committee elects to grant said license, with the approval of the City Council, it shall first require said applicant to enter into bond in the penal sum of $1500, with good and solvent sureties, conditioned to save the city harmless from all danger of whatever kind resulting from negligence or unskillful work on the part of said plumber, and abide by the rules and regulations made by the city touching plumbers' work. The above bond will be renewed every year, and failure to renew the said bond as above required or demanded shall of itself operate as a revocation of said license.

ANNUAL WATER RATES.

Bath, private residence	$6.00
Bath, private residence, each additional tub	3.00
Bath, private residence, summer rate, 6 months	4.00
Bath, boarding house	8.00
Bath, boarding house, each additional tub	4.00
Bath, boarding house, summer rate, 6 months	5.00
Baths, public, each	14.00
Baths, above 4 tubs, meter, or each	10.00
Urinal, private, self closing	6.00
Public, self closing	10.00
With stop cock, 1-16 inch opening	15.00
Constant flow, 1-16 inch opening	30.00
Constant flow, larger opening	meter.
Water closet, private, one closet	5.00
Private, each additional	3.00
Private boarding or lodging house, 1	6.00
Each additional	3.00
Public, one closet	8.00
Automatic flushing	meter
Wash basin, plain cock	12.00
Self closing	8.00

SEWER RATES.

Water closets, public, each	$4.00
Private	2.50

CEMETERIES.

Water consumers using water for grave lots, in any of the cemeteries, will be charged as follows:

One cent per square foot per year, with minimum rate of $1 per year, payable yearly in advance.

METER RATES, PER 1,000 GALLONS.

Determined by the monthly consumption, Sundays included.

Gallons per day.		Gallons per day.	
100 to 200	$0.40	1,401 to 1,600	$0.26
201 to 400	.38	1,601 to 1,800	.24
401 to 600	.36	1,801 to 2,000	.22
601 to 800	.34	2,001 to 3,000	.20
801 to 1,000	.32	3,001 to 5,000	.18
1,001 to 1,200	.30	Over 5,000	Special.
1,201 to 1,400	.28		

A minimum rate of $10 per annum will be charged on all metered services where the consumption is less than

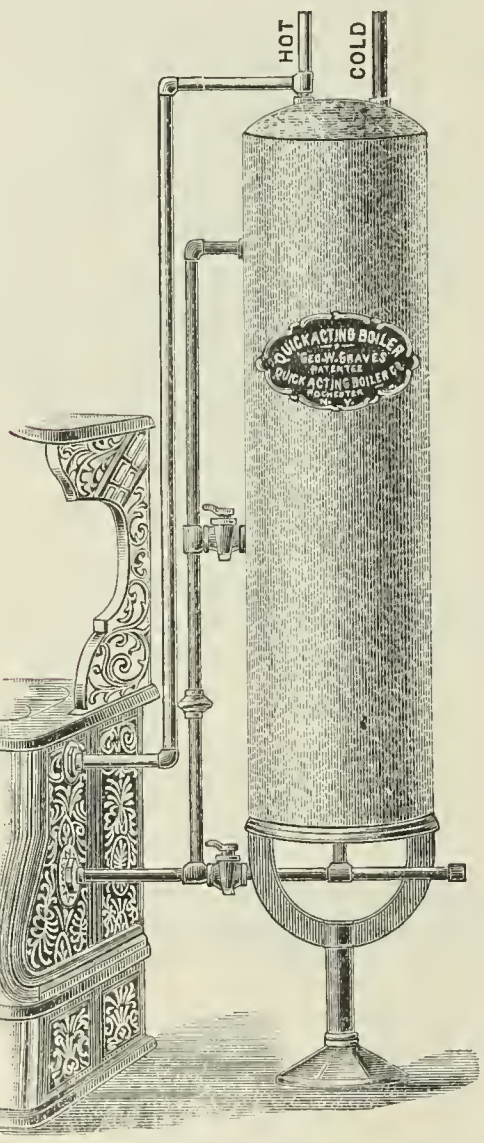
12,000 gallons during the fiscal year, to be paid quarterly in advance, with no charge for rent of meter.

The above charge allows the consumer from 1 to 1000 gallons of water per month ; more than 1000 gallons per month to be paid monthly at the above schedule of meter rates.

A yearly rental of $6 shall be charged for the use of each meter, payable monthly, except in cases where the consumers pay the minimum rate.

The Quick Acting Boiler.

The use of gas for heating water for domestic purposes has brought out various devices for use in connection with the ordinary kitchen boiler. In the accompanying illustrations we show the boiler brought out by the Quick Acting Boiler Company of Rochester, N. Y., and manufactured by the John Trageser Steam Copper Works, 447-457 West Twenty-sixth street, New York City. When gas is used in connection with the regular kitchen boiler it is found that circulation through the entire body of water in the boiler delays securing a supply of hot water. The boiler shown in Fig. 1 is designed for use in connection with either a coal or gas range, and in order to secure hot water quickly connections are made at three different points in the boiler to carry the colder water to the water back, and it may be readily seen from the cut that when the stop cock on the pipe at the bottom of the boiler and the side connection are closed only a small quantity



The Quick Heating Boiler.—Fig. 1.—Boiler Connected with Cooking Range.

of water in the upper part of the boiler is in circulation. When more time can be spared and a larger quantity of water is needed, by opening the stop cock in the middle connection a larger quantity of water is put in circulation and heated. When it is desired to heat the entire quantity of water in the boiler, by opening the bottom stop cock all the water in the boiler will be circulated through the water heating device.

In Fig. 2 the boiler is shown in connection with an independent gas water heater, the same provisions being made for circulating all or different portions of the water in the boiler through the heater. When the two stop cocks are closed it is claimed that with the average heating device 10 gallons of water can be heated to a temperature of about 150 degrees in about 20 minutes, which will give from 25 to 30 gallons of water at the temperature required for bathing, and it is pointed out that this fact alone shows the advantage of this type of boiler when used with modern apparatus. In many instances a large boiler used in connection with a coal range giving satisfaction is connected with a gas range having a water heater of less capacity, and which is used only at short periods during the day, and under such firing a large

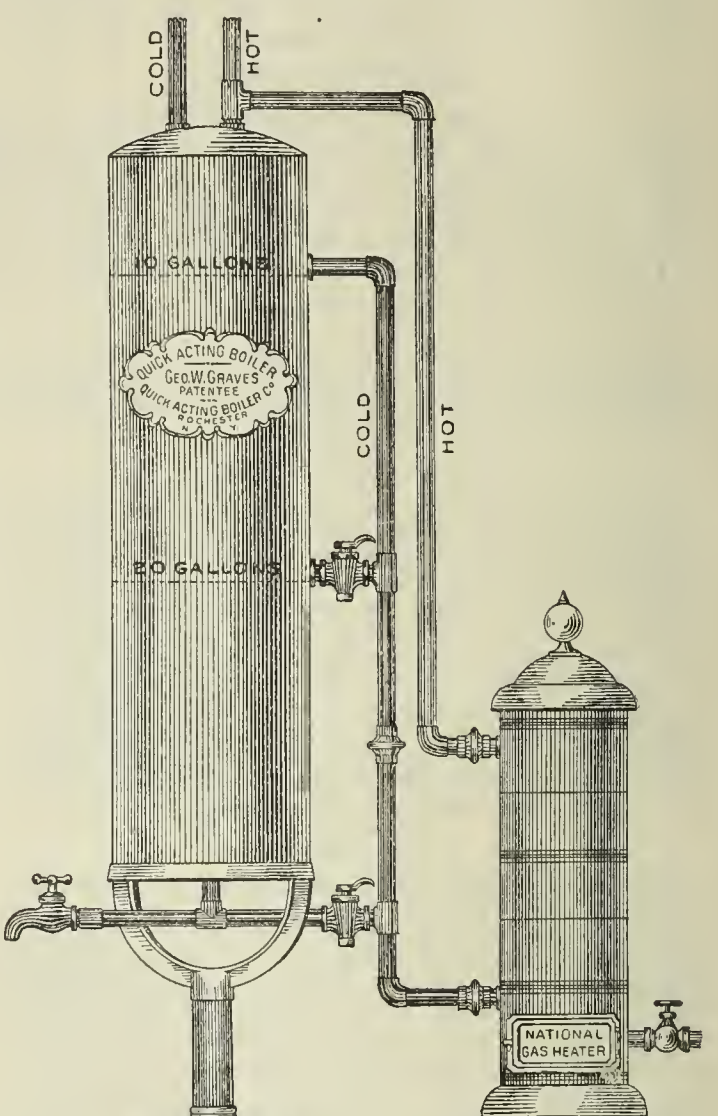


Fig. 2.—Boiler Connected with Independent Gas Heater.

boiler fails to furnish the necessary domestic supply of hot water. It is pointed out that with a boiler of the type shown satisfactory operation is secured when connected with a coal range and also when connected with a gas range. Circulars illustrating and describing the boilers and giving information as to the economy with which the work can be done, and the prices, can be secured on application.

Making Soil Pipe Joints.

BY A WORKMAN.

I have noticed that my employer takes more pleasure in showing to his customers as they come to new buildings in which he is doing the work his completed work than he does the roughing-in work, and yet those who are engaged in the plumbing business know thoroughly well that care in doing the roughing-in work is of more importance than the handsome finish in the bathroom of a luxurious mansion. To some it is a simple matter to make the joints in cast iron soil pipe. They think that it is only necessary to put in some oakum in order to prevent the molten lead from running down the pipe, and then, if the lead wells up slightly above the top of the hub and is flattened down, that all is done that is required.

In one case where I worked on a job of running the soil pipe in a building seven stories high there were several stacks of soil pipes. I ran two of the stacks, and the men who worked on several of the other stacks were from one and a half to two floors ahead of me with their work, which was noticed by my employer, who remonstrated with me for being so slow, saying that he paid me the same wages as he did the others and expected to get as

much work done in a day for his money. I told him that if he carefully kept a record of the time required in making the joints and repairing leaks I thought he would make more money on me than he did on some of the others, and with this answer he seemed satisfied to wait for the final result. I had but one leak in my work, which was overcome by a little extra calking. There were several leaks in all of the other stacks of soil pipe, and the result was that I was employed three days in repairing these defects. On this account I thought that some in the trade might be interested in my method of making a joint.

I am careful to pick over my oakum, and to have a good yarning tool. In putting in the oakum I am careful to have the spigot end of the pipe centrally located in the hub. I pour all of my joints, whether horizontal or upright, with a gasket, so that on removing the gasket the lead has an upward pitch from the hub to the pipe, as shown in Fig. 1. After the lead is poured, I take a cold chisel and go all around the pipe, and drive the lead from the pipe until it assumes the shape shown in Fig. 2. Then with a tool that is wide enough so that it will not wedge down between the hub and the pipe so as to split it, I flatten all expanded lead so that when it is finished it is as shown in Fig. 3.

A mechanic will readily see that by flattening the lead down it must be forced tightly against the pipe and against the inner side of the hub, making not only a tight joint against sewer gas and water, but also one that is less likely to be affected and destroyed by expansion and contraction than a joint that is made by a simple riveting process, as is the case when the lead is allowed to well up a trifle above the hub and then driven down into it without anything to induce a sidewise expanson.

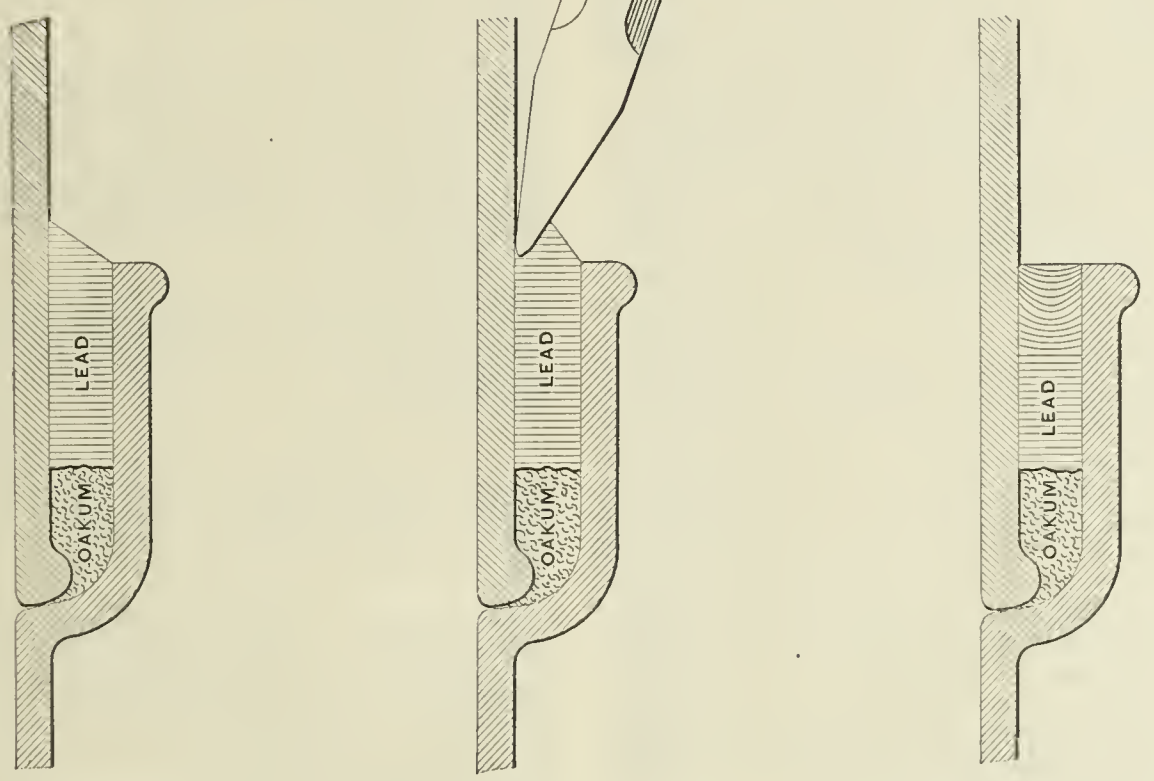


Fig. 1.—Joint Poured with a Gasket. *Fig. 2.—Setting the Lead Away from the Pipe.* *Fig. 3.—Showing the Lead Expanded to Make a Tight Joint.*

MAKING SOIL PIPE JOINTS.

Ideal Direct Draft Boiler.

The American Radiator Company, Lake and Dearborn streets, Chicago, are bringing out the Ideal direct draft boiler for steam heating. It is especially recommended by the company for use in localities having a poor quality of soft coal. The flue surfaces are easily accessible for cleaning. This boiler is of the vertical portable type, and in it are retained the features which have made the Ideal line of boilers distinctive. In the fire pot and first section above it are the largest water spaces. The dome provides for ample steam capacity, and the circulating column at the back of the boiler insures a steady water line. This circulating column is a distinguishing feature of Ideal boilers. The sections are connected with cast iron push nipples. Economy in fuel consumption is one of the claims made. It is furnished in 14 sizes, ranging from 225 square feet of direct radiation to 1500 square feet.

President Faure Booming Bathtubs in France.

President Felix Faure of the French Republic is a great advocate of cleanliness and sanitation. From all accounts he is doing more to spread the use of the bathtub in France than any other Frenchman of these or former days. A Paris correspondent of the New York *Sun* says "that wherever the President goes for a week or ten days there must be a bath house with all modern improvements. He refuses to stop even over night in a house or hotel that has no bathroom. His hobby causes many persons inconvenience, for the bathroom is not a universal institution in France as in this country. In fact, the provincial French towns are as barren of private bathtubs as most prairie villages in this country. Nevertheless the President holds fast to the bathtub as a condition precedent to his visit to any town or castle. In the Presidential palace in Paris and in the castle at Foutainebleau, M. Faure has had elaborate bathrooms fitted with the latest appliances and luxuries. In the castle at Rambouillet last year the President caused $20,000 to be spent for bathrooms which he might use during his three or four weeks' residence there.

"The President's passion for cleanliness has been a source of much vexation and industry at all the proviucial prefectures which he has visted since succeeding M. Carnot. Usually on his excursions through the land he lodges at these prefectures, and, as none of them was provided with bathrooms when he began his tours, there has been a great bustling about to make good the deficiencies. A large bath house was built last year at the prefecture in Rennes, preparatory to his brief sojourn there, and a similar house was erected at the prefecture in Valence this year in anticipation of his visit. The vigor with which the President is leading his movement for bath reform is said to have brought him many converts and to have given the neglected bathtub industry a great boom in the republic."

James J. Lawler of the Lawler Water Feed & Damper Regulator Company, New York City, spent a portion of last week in Philadelphia attaching three of his Regulators to a large Heating Plant installed by Robert Scott & Co., at Glenside, Pa., in which three large sized Mercer Boilers were used.

Streets Not Periodically Torn Up in Germany.

In writing from Germany a correspondent of a Chicago paper compares the practices and customs there with those of the United States, and the following extracts will be of more or less interest to the plumber :

"In Germany everything is done in a thorough, permanent way. We build for years. They build for centuries, and in the transition of the romantic old capitals of petty princes and grandiose dukes into smoky and bustling industrial centers the Germans have brought habits of thoroughness, patience and stability that have characterized all their progress in the arts of civilized life. They have shown more of the scentific spirit and method than any other people. The old streets have been extended and widened through the little farms of the poor or the suburban seats of the magnates and paved with asphalt or Belgium blocks, and schools and public libraries, art galleries, museums and other means of education, which the Germans consider essential to civilization, have followed the extended streets as regularly and as rapidly as water and gas supplies.

"The municipal authorities regulate building in the severest fashion. The new streets require the best kind of paving, and it is not put down to be torn up again in a few months to lay a forgotten gas or sewer pipe, but before the contract is let for paving the officials make sure that they have taken care of everything that needs to go underground for generations. In Chicago, in Washington and other American cities a street is paved upon petition or when the money is appropriated. The next year a new gas pipe must be laid along that way, the pavement is torn up for a mile or two, and it is generally eight or ten months or a year perhaps before the Commissioner of Public Works succeeds in persuading the gas company to replace it. The next spring the Water Commissioners decide that a larger pipe should be laid in that street and the pavement is torn up again. The year following another gas company is formed, and the pavement is torn up in order to enable it to furnish competition with the old one. The next year the first gas company discovers that its facilities are not adequate, and rips up the pavement again. Every reader will recognize his own experience and realize that within a period of ten years an amount equal to the original cost of the pavement is wasted in repairs and in replacing it for the purposes named, without considering the inconvenience and annoyances suffered by the people who live in the street.

"In Germany they do things differently. Before a pavement is laid the experts—and they are experts with university degrees framed and hanging in their offices, not ward politicians—who have charge of underground engineering put their heads together and consider what pipes and connections are likely to be needed along that particular street during the next three or four centuries. Then when these are supplied the pavement is laid, and it is not laid upon a thin crust of broken stone, but upon a foundation that will last forever. I saw some workmen trying to cut away a section of pavement in Berlin to make room for the foundation of a new monument. With crowbars, pickaxes, chisels and drills they had gone down about 12 or 14 inches into the pavement and were just able to jam a crowbar into the stuff so that it would support itself. This pavement cost money when it was originally laid, but was put down to stay, and $100,000 expended in that manner at the start will last longer than $1,000,000 worth of the pavements that are laid in American cities."

A three-sided lead pencil is received from the Nason Mfg. Company, 71 Beekman street, New York City, the different sides being red, white and blue, and bearing the inscription that they can furnish Pipe, Fittings, Valves and Steam Engineering Specialties. It is supposed that the heating contractor who is possessed of one of these pencils can invariably figure a profit where the Gulf Stream and Equator Heaters and the Nason Specialties are included in the estimate.

The Detroit Brass Works, Detroit, Mich., will erect a new two-story brick factory 85 x 100 feet in size.

Plumber for the Government.

The United States Civil Service Commission announces that it is desired to establish an eligible register for the position of journeyman plumber. From the register thus established a selection will be made, from eligibles residing in the vicinity, to fill a vacancy in the position of journeyman plumber in the United States Court House and Appraiser's Stores Building, at San Francisco, Cal., at a salary of $5 per day, Sundays excepted.

Persons desiring to compete for this position should apply to the secretary of the Board of Examiners at the post office at San Francisco, Cal., for application blank forms 304 and 394, which should be properly executed and promptly forwarded to the United States Civil Service Commission, at Washington, D. C. No applications will be accepted after the hour of closing business on November 6, 1897.

NOTES.

The examination of master and journeymen gas fitters in Boston began on October 1, when the new law relative to the licensing of gas fitters and to the supervision of gas fitting in Boston went into effect. The examining board consists of Dr. Samuel H. Durgin, chairman of the Board of Health, Building Commissioner John H. Damrell and Charles B. Gould.

The City Council of Pawtucket, R. I., has authorized Inspector of Plumbing J. Sewall Reed to purchase a smoke testing machine for the purpose of testing plumbing in new buildings after the fixtures are set.

The Royal Steam Heater Company of West Gardner, Mass., have secured the contract for heating the new high school building, in which it is stated over 7000 feet of piping will be required.

John A. Holland of Norwich, Conn., has secured the contract for heating the new Post Office and Custom House Building at New London, Conn., and will use a Wrought Iron Tubular Boiler and the Direct and Indirect Radiation manufactured by the H. B. Smith Company of Westfield, Mass.

A letter from O. L. Jayne informs us that the Fletcher-Steen Hardware Company, Boise, Idaho, have been awarded the contract for installing a Hot Water Apparatus in the Odd Fellows' Building in that city, and will use 2460 square feet of Direct Rococo Radiation. The hot water will be supplied from the hot artesian wells.

Under the firm name of Menzies & Menzies, John and Charles Menzies, formerly connected with the Robert Morgan Plumbing Company, have opened up a Plumbing establishment at 6 Pitkin street, New Haven, Conn. In a circular they make the announcement that their efforts in the trade will be principally devoted to Sanitary Plumbing, Gas and Steam Fitting.

The Automatic Water Tank Company have been incorporated at Mankato, Kan., by W. S. Field, G. F. Smith, D. H. Stafford and N. E. Stafford.

Shainline & Moires have opened a Plumbing establishment at the corner of Fifth and Green streets, Bridgeport, Pa.

An error was made in *The Metal Worker* last week in referring to the Italian Flue Radiator for hospitals by stating that it was next door to where it is. We have no doubt that any who called at the wrong place to see it were directed to the American Radiator Company, at 92 Centre street, New York, for the New York representatives of the American Boiler Company are very courteous.

An English plumber who was inclined to nurse his job until another hove in sight, to the disgust of the house owner, was greeted on entering the bathroom one morning with a ribbon bearing the following inscription in old English:

"Gette dun, annde fromme thys roome gette oute,
Hyf youre notte dun toe daye ye bosse will shoute."

Bids for heating and plumbing the girls' dormitory of the West Virginia Colored Institution, at Piney Grove, near Charleston, W. Va., will be received by the Committee on Heating until October 9.

H. S. Higgins, formerly assistant treasurer of Richmond Stove Company, Norwich, Conn., has resigned his position with that company and will associate himself with the H. R. Barker Mfg. Company, Lowell, Mass.

It is reported that Arthur MaGonagle, the well-known heating engineer, will hereafter be connected with Isaac Coffin & Co., Boston, with which concern he was formerly identified.

W. C. Higgins, who, as we announced last week, has associated himself with the Magee Furnace Company of Boston, still has his home in Norwich, Conn., though he

expects to move to Boston in a few months, so as to be nearer his place of business.

"Richmond" in red letters on an orange cover refers to Steam and Hot Water Heaters, shown in a new 32-page catalogue which the Richmond Stove Company, Norwich, Conn., are desirous of placing in the hands of every heating contractor who has not received it. It is printed on fine paper with the text and cuts in black and the ratings, dimensions and prices in red. It opens by briefly reviewing several branches of the heating trade, and shows cuts of the different series of Richmond Vertical Sectional Steam and Water Heaters and of their new series of Round Heaters. Their smaller heaters are shown with a new ash pit and an improved grate. The last pages are devoted to testimonials.

Hereafter all plumbers in the city of Milwaukee, Wis., will have to pass an examination before they will be permitted to engage in their trade. A Board of Examiners to test the fitness of plumbers has been organized by the election of George H. Benzenberg as president and F. W. Pripps as secretary. The Board of Public Works and Plumbing Inspector O'Reilly are also members of this Examination Board. Master plumbers must pay a license of $2 and journeymen 50 cents. These licenses are to be renewed annually, at an expense of 50 cents.

Lewis & Kitchen, Kansas City, Mo., have the contract for a steam plant for the Steinacher School.

C. S. Eames, Bridgeport, Conn., is plumbing a fine residence for Dr. Gibney.

George M. Couch, Hartford, Conn., who makes a specialty of the heating apparatus of the Howard Furnace Company, informs us that he has contracts for 16 Howard Furnaces and Combination Heaters.

The new Dale Basin is one of the attractions in the plumbing showroom of C. Hoffman, Jr., 242 Pearl street, New York. The waste operates with a lever that is positive in action and there is no chain to handle. The overflow duct can be easily cleaned, which completes its sanitary features. The trade are invited to investigate it.

H. A. Roth & Co., Elizabeth, N. J., write us that they have the contracts for steam heating plants in the buildings of R. Rindell, P. Keller, A. Durfredick, I. Hillies, McManus Brothers, and the Holy Rosary.

J. F. Gorman, of the Gorman & English Company, Wilkes Barre, Pa., was in New York this week visiting the trade in the interest of the Gorman Radiator Rest, which, he says, is finding favor with the heating contractors. Their catalogue gives full particulars.

T. Guy Haywood, secretary of the Richmond Stove Company, Norwich, Conn., was a visitor at the New York office, 85 Centre street, this week.

Chas. B. Scott & Co., heating contractors, of Scranton, Pa., have opened an office at Room 102 Liberty Building, New York, in charge of H. R. Stickney.

Percy McCallum, the Eastern representative of the Powers Regulator Company, Chicago, was at their New York office, at 54 John street, after an absence of several days spent in Boston adjusting affairs relative to the recent fire at that office.

A well organized movement is in progress to secure the enactment of an ordinance to regulate plumbing at Chattanooga, Tenn.

A. W. Halstead has opened a plumbing and tinning shop on Chestnut street, north side, Roselle, N. J.

The Waco Electrical Supply & Plumbing Company of Waco, Texas, have been incorporated, with a capital stock of $10,000. The incorporators are A. P. Moore, A. P. Duncan and J. J. Juaddell.

The Hart & Crouse Company, Utica, N. Y., inform us of some important heating contracts up the State in which the Royal Boilers will be used, and Manager W. M. Mackay of the New York office supplements the list with some others. Royal Hot Water Heaters will be used in the residences of E. S. Odell, Utica; Fred. Englehart, St. Johnsville, and J. T. Thompson, Oneida, and two No. 79 Steam Boilers will be used in the residence of Robert W. Tailer, at Richfield Springs. Four No. 77 Royal Steam Boilers will be used for heating the Hagadorn Building, Brooklyn; two No. 96 Royal in the Kindergarten School, Rivington street; two No. 90 Royal in the Gerry office building, New York, and a No. 57 Royal Hot Water Heater in the residence of Professor Hutton of Columbia College. Hornbaker & Bowers, Washington, N. J., are using a No. 77 Royal Steam Boiler for heating the First National Bank building. H. S. Brower, Gifford's, Staten Island, N. Y., is using a Steam Royal for heating the new school building. W. H. Dickinson & Co., Jersey City, N. J., are using a No. 69 Steam Royal for heating the residence of E. Price. Carmichael & Co., New York, are using a No. 49 Royal Hot Water Heater for Sunnyside, historic as the residence of Washington Irving, at Tarrytown, N. Y.

An Improvement in Galvanizing.*

BY GEORGE REESE.

The object of this paper is to call attention to a recent advance in the art of galvanizing, by which many objectionable features are obviated which have heretofore characterized the methods of manufacturing generally in use, thereby insuring not only greater rapidity of production, better quality of product, economy of fuel, labor, capital, interest and other charges, but also resulting in the production of new forms of galvanized wire or coated material hitherto unknown to the trade.

For certain special uses of iron and steel it is desirable, in many cases, to give the metal a coating which will be a protection from oxidation, and at the same time facilitate the uniting of different parts by soldering the coatings together. This is effected by immersing the iron, after it has been properly cleansed and prepared, in a bath of molten zinc, whereby a coating of zinc is obtained which firmly adheres to the iron, by reason of the alloying action between the two metals. This operation is universally known as galvanizing (which, it may be remarked incidentally, is a misnomer), and differs very little from tinning and lead coating. The protection from oxidation, in galvanized wire, is fully accomplished when a very thin and uniform coating is obtained; but where the wire is afterward to be subjected to twisting and bending, such as twisting the ends of telegraph wires together, or the weaving of wire cloth, the wire should be soft and the zinc as pure as possible, so that the elongation of the two metals are as nearly equal as possible, otherwise the coating is liable to crack and peel off. In galvanizing it is necessary that the iron operated on should remain in the bath until it acquires the same temperature as the molten metal, or the coating will not adhere; this, in the case of galvanized wire, necessitates the maintenance of large tanks of molten zinc, containing often as much as 50 to 60 tons of metal.

In the usual method as heretofore practiced, a number of previously prepared wires are drawn slowly through the molten bath of coating metal, and, upon emerging therefrom, are passed through tightly enveloping wipers of asbestos or other material to remove the excess of coating upon their surfaces. This method is necessarily slow, because the time of transit through the bath is fixed by the fact that the temperature of the wire must be raised to, or approximately to, that of the spelter in order that it may receive a thin, durable coating, and also because of the frequent breakage of the wires from the tension exerted upon them by the action of the drawing and reeling devices. The speed at which No. 12 wire is coated being from about 50 to 60 feet per minute, this gauge runs from ¼ to ½ mile, and smaller gauges several miles in length, per bundle. Hence, although many devices have been adopted for increasing the production and decreasing the breakage, by complicated apparatus for drawing larger numbers of wires through the bath and the wipers, and by giving notice of undue strain exerted upon the wires by tension, the output of each bath was and necessarily will be low, in the use of this old method. This in itself called for the use of a large number of galvanizing pots in order to bring up the output of the factory to the paying point. Any increase in the speed of drawing inevitably requires a corresponding increase in the length of the pots because the time of transit through the bath cannot be shortened below the limit before mentioned. The maintenance of an enormous tonnage of spelter in a fluid condition, constantly exposed to oxidation and to the destructive alloying action of the metallic surfaces of the pots, entails great loss, trouble and annoyance by the rapid formation of dross and oxides The percentage of dross should be kept as low as possible to insure proper fluidity and working of the bath. This dross consists mainly of spelter, which granulates after alloying with a very small percentage of iron, and, being heavier than the pure spelter, sinks to the bottom of the bath. Its formation, in conjunction with the necessity of drawing the wires slowly through long, deep, wide baths, has entailed great loss. It will be seen, therefore, that the method of drawing wire through a bath and wipers is radically defective in its principle of operation, of progressively subjecting succeeding portions of the coating to the action of the wipers by tension, apart from any defects in apparatus used for such purpose; yet, notwithstanding, it has continued in use as the only practical method heretofore known to the art for giving a good and reasonably uniform coating to ordinary or fine wire.

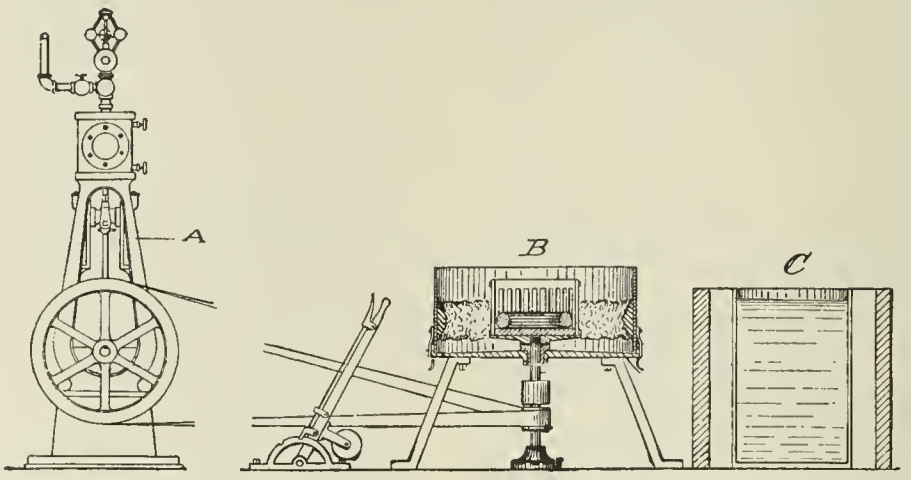
By a newly patented method, the practicability of which has been demonstrated at the works of the Sharon Hill Galvanizing Company, Darby, Pa., wire can be coated in a cheap, rapid and efficient manner at a speed heretofore impossible to attain, and of a quality, uniformity and finish of coating unequaled by that of the wiping process. This is done by a method of operation which

* A paper read before the Franklin Institute, Philadelphia.

prevents the breakage by tension and the imperfect ends which occur in the wiping method; it obviates also the necessity of keeping a large tonnage of spelter constantly heated and exposed to the formation of dross by alloying and oxidation, reduces investment, capital, interest, fuel, labor and other incidental charges, and enables the manufacturer, with a small cheap plant, to exceed the output of the large costly plants now in use. The securing of these results is obtained by a radical departure from the principle of operation of the old wiping method of progressively applying tractive force to successive parts of the wire or bundles; and in lieu thereof each and every part of the coating upon the wire is simultaneously subjected to the action of a centrifugal strain greater than the combined adhesive and capillary attraction acting to retain the superfluous material upon the surface of the wire or between the strands of the bundle, thereby leaving a smooth, flexible, adherent and uniform coating upon the surface of the product. This is effected by means of an apparatus shown herewith, in which A represents the motive power, B a centrifugal separator, which is generally known as a hydro-extractor, and C the galvanizing bath.

tion of the first cost, cost of repairs, fuel and labor. As few and comparatively small pots are used, but little spelter is required to be kept constantly in a molten condition, subject to continual oxidation and the formation of dross from the alloying action of the metal of the pots. The large amount of capital heretofore required to purchase and maintain in a fluid condition the large tonnage of spelter in comparison with the output, is not required for such purpose. Like the old wiping process, it produces a smooth, uniform, flexible coat of galvanizing material upon the wire, but has the advantage of having no breakage from tension and no waste ends on the bundles; finally, it saves capital on account of diminished labor, fuel consumption and power, concentrates the size of plant, requires less ground, fewer buildings, repairs, &c., and enables the manufacturer of galvanized wire to produce, in a cheap and rapid manner, many forms of wire heretofore unknown to the trade.

Among the new articles produced by this method is barbed wire, which has been galvanized after it has been twisted into shape and formed into bundles. When wire is galvanized before being barbed and twisted, much of the



THE REESE GALVANIZING APPARATUS.

The coils or bundles of wire are cleansed by acid and prepared in the usual manner to receive their coating. A whole bundle is then dipped into the bath of melted spelter, and when it has received a thorough coating it is removed to and dropped into the centrifugal separator, which may be in motion for small light coils, or the machine may be started after heavy bundles are placed in it. After a short time the wire attains the same speed as the machine and the surplus coating is almost instantly thrown off against the safety shield. The machine is then stopped and the bundle removed. This part of the process is performed as quickly as possible, in order that none of the coating may solidify until after its removal from the machine. The wire is then subjected to an operation designed to prevent the strands from becoming welded together when such solidification takes place. This is accomplished by jarring the bundle on a block to keep the different strands in motion or separated from each other, or by unwinding the bundle and rewinding it in such a manner that the coating may solidify while in transit from the unwinding to the rewinding reels.

In practice it has been found that a speed of 750 revolutions per minute is sufficiently high to do good work on No. 20 wire in bundles of 10 inches diameter. Larger gauges require less speed, because the wire retains the heat longer and because less capillary attraction is exerted where the spaces between the wires are greater; variation of the initial heat of the bath also causes variation in the cohesive force of the spelter, and variation of the chemical constituents of the bath is also a factor, as some baths work more fluid than others at a given temperature. Smaller gauges of wire and smaller bundles also call for an increased speed of rotation; but in general I have found that the minimum and maximum speed of rotation required are about 500 and 1500 revolutions per minute when operating on 10-inch bundles.

The chief advantages of this method are: As it is only necessary to subject an entire bundle of wire for a few seconds of time to the action of the centrifugal separator instead of drawing a small number of strands through wipers at the slow speed of not more than 1 foot per second, as in the old wiping process, the bundles are finished as fast as they can be raised to the proper temperature and coated in the galvanizing bath, hence the tonnage output per pot is enormously increased, especially so on fine wires, some of which are many thousands of feet in length to the single pound, and which could not be made for general consumption on account of the prohibitive price of such galvanizing product. The vast increase of product from each pot renders few of them necessary in plants of large tonnage capacity, thereby saving a large proportion of the first cost, cost of repairs, fuel and labor. As few and comparatively small pots are used, but little spelter is required to be kept constantly in a molten condition, subject to continual oxidation and the formation of dross from the alloying action of the metal of the pots. The large amount of capital heretofore required to purchase and maintain in a fluid condition the large tonnage of spelter in comparison with the output, is not required for such purpose. Like the old wiping process, it produces a smooth, uniform, flexible coat of galvanizing material upon the wire, but has the advantage of having no breakage from tension and no waste ends on the bundles; finally, it saves capital on account of diminished labor, fuel consumption and power, concentrates the size of plant, requires less ground, fewer buildings, repairs, &c., and enables the manufacturer of galvanized wire to produce, in a cheap and rapid manner, many forms of wire heretofore unknown to the trade.

Among the new articles produced by this method is barbed wire, which has been galvanized after it has been twisted into shape and formed into bundles. When wire is galvanized before being barbed and twisted, much of the coating cracks and peels off and the points of the barbs where they are not coated, become blunt by rusting. This new article cannot only be produced much more cheaply, but is also more durable, and, as the points of the barbs are completely coated, it retains its efficiency much longer than the old kind. Twisted fence bands are rapidly galvanized in the bundle by this method after they are formed. Samples of wire rope illustrate in a remarkable manner how perfectly the superfluous coating material may be eliminated by centrifugal action and yet leave a perfect coating upon the wires. Wire cloth is galvanized by the old method from two meshes to eight meshes per lineal inch; but in cloth finer than eight meshes so many of the meshes become permanently closed with the coating material that it is impossible to produce a marketable article. By the new method cloth of any fineness may be coated if the speed of rotation be increased with the fineness of the cloth operated on. There have been produced samples of 12 x 13 fly wire and No. 16 mesh, which I believe was the first cloth of this kind ever successfully galvanized after being woven.

A plan is being worked out for using some of the power of the James River at Richmond to generate electric power for transmission to consumers in the neighborhood. The General Electric Company have made provisional contracts with consumers to the amount of about 2500 estimated horse-power. It is estimated that they must get contracts for 3500 to 4500 horse-power before beginning work. The company are now applying for a franchise from the City Council and expect to apply for a charter at the next session of the Virginia Legislature. There is a possible development by using a system of storage of from 12,000 to 15,000 horse power the year through.

The important Belgian engineering firm, the Cockerill Company of Seraing, near Liege, have declared a dividend of 20 per cent. for 1896-97, as against 16 per cent. for 1895-96. The directors have also decided to propose an increase of the share capital from 7,500,000 francs to 10,000,000 francs, by the issue of 5000 new shares of 500 francs, to be offered to the present shareholders at a price yet to be fixed. This increase is to provide funds for the considerable extension of the company's mining operations recently undertaken, for the establishment of their Ostend-Tilbury steamship service, for the erection of new basic Bessemer steel works and for the enlargement of the gun factory.

Bids are soon to be called for on the elevation of the Erie Railroad tracks at Jersey City, N. J.

TIN PLATES.

THE METAL WORKER QUARTERLY LIST OF AMERICAN TIN PLATE WORKS.

Herewith are presented for the information of our readers *The Metal Worker's* regular quarterly lists of American tin plate mills and dipping works, together with the brands of tin and terne plates made by each. These lists, which are revised and corrected to October 1, 1897, fully illustrate the existing condition of the American tin plate industry and show a gratifying degree of progress in this department during the last three months. The information contained in them was secured directly from the various manufacturers within the past few days and may be taken as absolutely accurate.

The present lists show that there are now 69 complete plants engaged in the manufacture of tin plate or black plate for tinning purposes in the United States. Forty of these are tin plate plants proper, rolling their own black plate, 35 of which are also tinning their product and finishing it for the market. Five works are as yet unprovided with tinning facilities, and dispose of their black plate to the dipping works. These 40 black plate plants possess 211 complete hot mills, and three of them are adding to their equipment 10 new mills. In addition, three new black plate plants, with an aggregate of 12 mills, are building, making a grand total of 233 hot mills in 43 separate plants run by 41 firms, as against 40 works with 211 hot mills completed and building on July 1, 1897. This is a net increase for the quarter of three works and 22 mills.

Of the 40 black plate plants, three small works, with an aggregate of six hot mills, are not in operation, by reason, mainly, of unfavorable location, and report no present prospect of running. The temporary idleness of about 15 other mills at various works, owing to transient causes, mainly the difficulty of obtaining a sufficient supply of steel, leaves a total of 190 mills in active operation on October 1. This is by far the largest capacity ever employed at one time in the history of the American tin plate industry, representing at a conservative estimate a current output of domestic tin plate at the rate of about 5,400,000 boxes a year, with a potential output for the finished mills (if they were all in operation to their extreme capacity) of quite 6,300,000 boxes annually. Adding the mills now under construction, which will nearly all be ready for work by the end of the year, the American tin plate industry should then be able to turn out close on 7,000, 000 boxes a year.

The numbers of dipping works, 29, and of tinning sets embraced in their equipment, 165, remain unchanged from those given three months ago. Several of these concerns are idle, and others only partially employed, many to but one-fourth to one-third of their capacity. Comparatively few of them are working to anything like their full extent, the exceptions being those which have established a reputation for high grade roofing plates or other specialties. In the manufacture of the ordinary commercial plates they cut but a small figure as compared with the mills.

As indicated above, the American tin plate industry has made substantial advances during the past three months, 15 new tin mills having been completed and added to the producing force in the quarter by the following concerns :

American Tin Plate Company	1
Falcon Sheet & Tin Plate Company	2
Licking Rolling Mill Company	1
Marshall Bros Company	2
New Castle Steel & Tin Plate Company	2
Washington Steel & Tin plate Mills	2
Cincinnati Rolling Mill & Tin Plate Company	3
Whitaker Iron Company	2

In the case of the two last named concerns, sheet mills were converted into black plate mills. The names of three new concerns have been added to our list—namely, the Cincinnati Rolling Mill & Tin Plate Company, Cincinnati, Ohio ; Hamilton & Co., West Newton, Pa., and Zug & Co., Limited, Pittsburgh, Pa. The two latter firms are each constructing a two-mill plant. The National Tin Plate Company's new eight-mill works, at Menessen, Pa., have made substantial progress toward completion. During the quarter the erection of additional hot mills has been begun at the following works : American Tin Plate Company, Elwood, Ind., 2 ; Crescent Sheet & Tin Plate Company, Cincinnati, Ohio, 2, and the La Belle Iron Works, Wheeling, W. Va., 6. The Laughlin Nail Company, Martin's Ferry, Ohio, are preparing to build a new six-mill plant, duplicating their present works. The Britton Rolling Mill Company, Cleveland, Ohio, have added a tinning plant to their equipment, and now finish their own black plate. Several more of the existing works are contemplating extensions to be undertaken at an early date, while there is a good prospect of tin plate works. now projected, being established at New Castle, Pa.; Johnstown, Pa.; Youngstown, Ohio, and other points.

Tin Plate Mills in Need of Steel.

The tin plate makers are seriously hampered just now by the difficulty of obtaining a sufficient supply of steel. The steel mills are so full of business that they seem unable to meet the requirements of the tin plate mills for bars. They are also much behind in making deliveries on contracts placed by the tin plate makers earlier in the year. The consequence is that some of the works have had to close down for the time a part of their capacity, while others are running irregularly, getting their bars in a hand to mouth way, starting and stopping after a few days' run. This is a very unsatisfactory state of things, and is also an expensive method of working. The present difficulty not unnaturally leads some of the tin plate makers to consider the advisability of putting in their own bar mills, so as to be independent in this respect. But those works which are furnished with bar mills are also finding a difficulty in securing enough steel billets to supply their requirements.

New Black Plate Plant.

Zug & Co., Limited, of Pittsburgh, will shortly be prepared to furnish black plate for tinning, and are now installing the necessary equipment. Two gas producers are being erected by Wm. Swindell & Brothers, engineers and contractors, of Pittsburgh. A heating furnace and an annealing furnace are also being built, and work has been commenced on a pickling vat. Two additional stands of rolls are being furnished by Mackintosh, Hemphill & Co. and an electric light plant is being installed, and electric cranes will hereafter be used in all departments of the plant. A large warehouse is being constructed and railroad switches are being built. The capacity of the plant will be increased one-half.

At the plant of the Beaver Tin Plate Company, Lisbon, Ohio, an accident occurred recently which disabled the engine driving the six hot mills. The breakage while not of a serious is of an annoying nature and caused a shut down of the hot mills for about ten days. As soon as necessary repairs can be made the plant will be put in operation again double turn in all departments, as the concern have a considerable number of orders on their books.

The Metal Worker Quarterly List of American Tin Plate Works.

OCTOBER 2, 1897.

TIN PLATE MILLS.

NAME OF FIRM.	LOCATION OF WORKS.	NO. OF HOT MILLS. Completed.	Building.	NAMES OF BRANDS. BRIGHT TIN PLATES. Charcoal.	Coke.	TERNE PLATES.	REMARKS.
Ætna-Standard Iron & Steel Co	Bridgeport, Ohio	8	....	Ætna AA1, Ætna AA, Ætna A, Ætna.	Ætna	Belmont, Belmont Best, Belmont Special, Standard.	[operation.
American Sheet Iron Co	Phillipsburg, N. J.	1					Make black plate only. Not in
American Tin Plate Co	Elwood, Ind. / Montpelier, Ind.	18 / 6	2 / .	Hazen, Imperial, P-e-e-r-l-e-s-s, / Premier	Hazen, Kanner, Koko, Kream, L-Wood	E-l-w-o-o-d, I-n-d-i-a-n-a, L-e-e-d-s, R-e-i-d.	Taggers brand, "Hazen."
Atlanta Steel & Tin Plate Co	Atlanta, Ind.	3	.		Atlanta	Atlanta.	
Baltimore Tin Plate Co	Locust Point, Baltimore, Md	4	..	Baltimore	Baltimore	Baltimore.	
Beaver Tin Plate Co	Lisbon, Ohio	6	..	Beaver A, Beaver AA, Beaver AAA.	Beaver	Beaver, Beaver Best, Beaver Special.	
Blairsville Rolling Mill & Tin Plate Co	Blairsville, Pa.	2	....	Juno, Pansy, P. S. & Co	Apex	Bala, Crown, Devon, Kelso, Merion, Old Style, Oil Finish, Orion, Orient Crown, Potts A L S Old Style, Potts Old Process, Rutter, Zenith.	
Britton Rolling Mill Co	Cleveland, Ohio	3	....	Britton, Buckeye	Britton, Buckeye.	Britton, Buckeye.	
Canonsburg Iron & Steel Co	Canonsburg, Pa.	4	....		Ensign, Pennant	Aurora, Coin, Dawn, Orient.	
Cincinnati Rolling Mill & Tin Plate Co.	Cincinnati, Ohio	3	....				Just started.
Crescent Sheet & Tin Plate Co	Cleveland, Ohio	4	2	Crescent AAA, Crescent AA, Crescent A	Crescent C	Crescent 1 Star, Crescent 2 Star, Crescent 3 Star, Crescent 4 Star.	
Cumberland Steel & Tin Plate Co	Cumberland, Md.	5					Make black plate only.
Ellwood Tin Plate Co	Ellwood City, Pa.	5	....	Anti-Rust, P.O.P., Saturn, Silverine.	American, American Palm	Banner, Charter Oak, M. F., Monogram, N. C. T., Weather-proof	
Falcon Tin Plate & Sheet Co	Niles, Ohio	6	....	Crocus, Daisy, Hyacinth, Jonquil. Tulip	Clover	Blueflower, Cornflower, Moonflower, Official, Starflower, Sunflower, Wildflower.	
Great Western Tin Plate Co	Joliet, Ill.	4	....	Moose	Elk	Drake, Duck, Swan.	
Hamilton & Co	West Newton, Pa.	....	2				Plant building,
Humbert Tin Plate Co	South Connellsville, Pa.	4	....		Humbert Coke.		
Irondale Steel & Iron Co	Middletown, Ind.	6	....	Albright, Crane, Crane B.	Crane C	Crane, Crane Old Style Redipped, Crane Spangle.	
La Belle Iron Works	Wheeling, W. Va.	4	6	Woodward A, Woodward B	La Belle	West Virginia A, West Virginia B, West Virginia Old Style.	
Lalance & Grosjean Mfg. Co	Harrisburg, Pa.	3	..	L. & G. Mfg. Co. AA1, L. & G. Mfg. Co. AA2, L. & G. Mfg. Co. AA3, L. & G. Mfg. Co. AA5.	L. & G. Mfg. Co. AA4. L. & G. Mfg Co. AA6, L. & G Mfg. Co. AA7.	L. & G. Mfg. Co. A1, L. & G. Mfg. Co. A2, L & G. Mfg. Co. A3.	
Laughlin Nail Co	Martin's Ferry, Ohio	6	....	Laughlin	Laughlin	Laughlin	Are about to double their capacity.
Licking Rolling Mill Co	Covington, Ky.	2	....			J. D. L., M. F. H., M. F. H. Best, M. F. H. Extra. New South.	
Marshall Bros. & Co	Philadelphia, Pa.	6	....	Penn Treaty AA Charcoal, Penn Treaty Best Charcoal	Penn Treaty.		
Monongahela Tin Plate Co	Pittsburgh, Pa.	9	.		Monon, Oliver (O.H.)	Iron City, Manchester, Sheffield, Soho.	
Morewood Co, The	Gas City, Ind.	8	....	Dorothy, Grace, Jack	R. H. J.	F W. B. Old Style, J. H. R., P. T. L.	
Morton Tin Plate Co	Cambridge, Ohio	3		Guernsey, Morton, Regent, White Rose	Cambridge, Thistle.	American Standard, Cambridge New Method, Cambridge Old Style, Economy, Leatherwood, North Star.	
National Tin Plate Co	Anderson, Ind. / Monessen, Pa.	6 /	.... / 8	Donner, Irwin, Matter	Anderson, National		Monessen plant under construction.
New Castle Steel & Tin Plate Co	New Castle, Pa.	20	.	New Castle Best Palm, New Castle Palm, New Castle Charcoal, Shenango	New Castle Palm New Castle Coke.	Juniata, New Castle Old Method, New Castle Terne.	
Ohio River Sheet & Tin Plate Co	Remington Station, Pa.	2	....				Make black plate only.
Pennsylvania Tin Plate Co	New Kensington, Pa.	4	....	Melvin, Range	B. G., Peconic	Defender.	
Pittsburgh Tin Plate Works	New Kensington, Pa.	6	..	Opal, Onyx	Alba, Alba Extra Lorna	Amber, Kensington, P. T. W. Old Fashion	Taggers brand, "Melba."
Reeves Iron Co	Canal Dover, Ohio	3	....				Make black plate only
Somerton Tin Plate Works	Brooklyn, N. Y.	3	....	Somerbrook, Somerton	Somerton		Not in operation.
Star Tin Plate Co	Pittsburgh, Pa.	8	....		Star.		
Stickney Iron Co	Baltimore, Md.	2	....				Not in operation.
St. Louis Stamping Co	St. Louis, Mo.	8	....	Granite, St. Louis	Steel Coke.	Acme Old Method, Alta, Extra Fine, S G, S L S Old Method.	
United States Iron & Tin Plate Mfg. Co.	Demmler, Pa.	5		U. S. Bright, Versailles, Youghiogheny		U. S. Eagle, U. S. Grant, U. S. Monongahela, U. S. Redipped	
Wallace, Banfield & Co	Irondale, Ohio	4	..	Irondale A, Irondale AA, Irondale AAA, Irondale B, Irondale BC.	Irondale C	Irondale A, Irondale AA, Irondale AAA, Irondale B, Irondale Old Style, Irondale W. B.	
Washington Steel & Tin Plate Mills	Washington, Pa.	4	....	Washington	Washington	Washington, Washington Old Style.	
Whitaker Iron Co	Wheeling, W. Va.	3	....				Make black plate only.
Zug & Co., Ltd	Pittsburgh, Pa.	....	2				Plant building.
Total Hot Mills		211	22				

DIPPING PLANTS.

NAME OF FIRM.	LOCATION OF WORKS.	NO. OF TINNING SETS.	NAMES OF BRANDS. BRIGHT TIN PLATES. Charcoal.	BRIGHT TIN PLATES. Coke.	TERNE PLATES.	REMARKS.
Alcania Tin & Terne Plate Co.	Youngstown, Ohio	3	Alcania, Americana, Columbia, Sylvania, Virginia	Alcania, Helena. Wallflower.	Columba, Los Angeles, Pasadena. Primrosa, Standard Al. Ainacla, Alcania, Cambria, Hawthorne, Mahoning, Mayflower. Plumbum, Supreme.	Lead coated plates.
American Tin & Terne Plate Co.	Philadelphia, Pa.	10	Arlington, Channing, Peerless.	Imperial, Franklin	Amer. M. S., Arrow, Black Diamond, Hancock, Horse Shoe, I. D. B., Keystone, Keystone Hand Dipped, Puritan, Quaker City.	
American Tin Plate Mach. & Mfg. Co.	Canal Dover, Ohio	8	†Althea, Carol, New Cresta, Rieka, Villette.	Ariel, Delta, S. J. R.	Barto, Crown Old Method, Eminent Old Method, Mingo, Pencoyd, Preble Extra, Sanatoga, *Dover, *Dover Extra, *Dover Old Method.	*Continuous roofing. †Tinned iron.
Apollo Iron & Steel Co.	Apollo and Vandegrift, Pa.	2			Apollo Terne Sheets.	
Buhl Stamping Co.	Detroit, Mich.	4				Make bright plate for their own use.
Cadwallader, C. W.	Pittsburgh, Pa.	4	Petunia, Primrose.		N. F., Optimus.	
Chicago Stamping Co.	Chicago, Ill.	5				Make bright plate for their own use.
Cincinnati Corrugating Co.	Piqua, Ohio.	1			Piqua.	
Ferguson Tin Plate Co.	East Liberty, Pa.	4			Extra Coated, Lima Redipped, Magnet, Old Style, Redipped, Volcano.	
Follansbee Bros. Co.	Allegheny, Pa.	5	Clifton, Finest.	Furnace	Braddock, Duquesne, Neville Old Style, Oakmont, Old Reliable Redipped, Orbit Redipped, Pittsburgh, Protection Old Process, Raymond, Scott's Extra Coated, Sherwood, Triumph Old Method, Thurso.	
Gummey, McFarland & Co.	Philadelphia, Pa.	4	Champion, Climax, Colonial, Mars, Neptune, Phœnix, Stag, Sun.		Alderly, Anchor, Climax, Continental, Eagle, Flag, Hercules, Leominster, Liberty, Penn Old Method, Pennsyl Old Method, Phœnix, Pioneer, Sterling Old Style, Venus, Victor, Waldo, X. L. C. R., Zone.	
Hamilton, John	Pittsburgh, Pa.	3	Ivy, Pansy	Pink.	Bonus, Fort Pitt, G. A. R., Hamilton's Best Redipped, Hamilton's Excelsior Hand Coated, Hazlewood, Killbuck, Lulu, Mingo Old Process. Osceola Old Style.	
Laufman (P. H.) & Co., Limited.	Apollo, Pa	2			Laufman's Apollo.	
Laufman Tin Plate Co.	Butler Junction, Pa.	4			Allegheny, Freeport, Laufman's Apollo, Tip Top.	
McDonald (The Jas.) & Sons Co.	Cincinnati, Ohio.	2			Eureka, Special, The J. McD. & Sons Old Style.	
Merchant & Co., Incorporated.	Philadelphia, Pa.	8	Florence, Minerva, Palma, Pisa, Spa, Violet.	Leslie, Rose	Alaska, American Old Style, Arch, Camaret, Elsie, Emlyn, Empire Hand Coated, Hickory, Kismet, Merchant's Old Method, Merchant's Roofing, Palm, Special Extra Coated, Stanley, *Tandem.	*Continuous roofing.
Meuher Bros. Co.	Brooklyn, N. Y.	8	Florida, Howard	Albert, Brooklyn	Excelsior, Flushing, Grace, Meurer's Genuine Tinned Iron Sheets, Meurer's Old Method, Meurer's Roofing, Pullman, Standard, Superior.	
Nivin & Hassard Tin Plate Co.	Philadelphia, Pa.	3	H. P., Jewel, Rambler.		Dandy, Echo, Nivin & Hassard New Method, N. & H. Roofing, Old Method, Sensation.	
Norristown Tin Plate Co.	Norristown, Pa.	6			Norristown New Method.	
Norton Bros.	Maywood, Ill.	18				Make bright plate for their own use.
Norton Tin Plate & Can Co.	Baltimore, Md.	15				Make bright plate for their own use.
Old Dominion Iron & Nail Works Co.	Richmond, Va.	3	Belle Isle, Belmont.	Bellevue, Belona.	Albemarle, Cherokee, Chesapeake, Greenbrier, Indian, Kanawha, Mohawk, Pawnee, Potomac, Rivanna, York.	
Phillips Tin Plate Co., Incorporated.	Philadelphia, Pa.	5	Century, Oak	Gladys, Walnut	Boston, Boston Old Method, Columbus, F. R. P. Extra, National, Phillips' Roofing, Republic, Zero.	
Reading Tin Plate Co.	Reading, Pa.	2			America. C. H., H. M., Horton, L. C., Mt. Penn, Reading Roofing, Spring.	
Record Mfg. Co.	Conneaut, Ohio	2	Record Charcoal A1, Record Charcoal A.	Record Coke.		
Simpson (W. T.) & Co.	Cincinnati, Ohio.	3			Boaz, Queen City Old Style, Riverside.	
Taylor (N. & G.) Co.	Philadelphia, Pa.	22	Brilliant, Hand Dipped, Linden, Merion, Royal.	Almond, Locust, Mint.	Columbia, Globe, Knoxall, Maple Old Method, Spruce, Taylor Old Style, Taylor Roofing Tin, Willow.	
Thotten (Nathan) & Co.	Philadelphia, Pa.	3			Elziver, Enid, Sharon, Triumph, Trotter's New Method, Trotter's Roofing, Trotter's Special, Verona.	
Wheeling Corrugating Co.	Wheeling, W. Va.	5	Ewing, Fort Henry, Wheeling.	Thayer	Eleanor, Helen, Margaret, Nelson, Wylie.	Operation suspended.
Total Tinning Sets.		162				

SCRAP.

The Licking Rolling Mill Company have had 30 arc lights of 1000 candle power placed in their Tin mill department at the foot of Eleventh street, Covington, Ky., in order to furnish light for continuous operation. The company are running triple turns of eight hours each. They have orders sufficient to keep the Tin mills in operation to December 1.

The Laughlin Nail Company, Wheeling, W Va., manufacturers of Tin and Terne Plates, with plant at Martin's Ferry, Ohio, are getting ready to build and equip another six-mill Tin Plate plant similar to the one they now have in operation. They hope to be ready to enter the market with product from the new plant about May 1, 1898.

The *Industrial World* of Swansea says that "a regular stream of Tin Platers" is again leaving the Welsh shores for America, going from Llanelly, Garnant, Crombwrla and other places.

The British Board of Trade figures relating to the Welsh Tin Plate industry, including returns from owners of 55 Tin Plate works, show that 10,730 persons were employed at the end of August, or 42 less than in July, and 2005 less than at the end of August, 1896.

Marshall Bros. & Co., Philadelphia, have just completed the installment of two new hot mills in their Tin Plate plant. This gives them an equipment of six mills with a weekly capacity of 3500 to 4000 boxes of Tin Plate.

Tests of Aluminum Utensils.

Several processes have been proposed of late years, says a French writer, quoted in *L'Aluminium* of Paris, for ascertaining the impurities contained in the aluminum of commerce. These processes, and particularly that of Monsieur Moissan, may give good results, but they occupy a great deal of time. I have sought out a more practical method of satisfying myself, immediately they are received, whether the various utensils of aluminum used today in the [French] army, such as drinking cups, measures, mess tins, saucepans, cans, &c., fulfill exactly the conditions imposed by the specifications. The metal employed is aluminum alloyed with copper.

In the first place, the aluminum should be of the standard of $\frac{995}{1000}$ with an allowance of not more than $\frac{5}{1000}$—that is to say, it should contain 99 to 99½ per cent. of pure aluminum. In the second place, a proportion of 2 to 3 per cent. of copper should be contained in it. The utensils should not be subjected to scouring with soda.

It is after having studied the action on these aluminums, under heat and cold, of muriatic acid, in degrees of dilution ranging from 1 to 25 parts of acid to 100 parts of water, that I have adopted the following system :

Simple Aluminum.—I put into a phial ½ gram (8 grains) of the metal cut into minute pieces, then add 50 parts of distilled water to 10 parts of pure muriatic acid. The action of the liquid is not slow to manifest itself and becomes more and more apparent as the liquid heats. So soon as the discharge of gas begins to slacken I take the phial to the stove at a temperature below 200 degrees F., and do not take it off until all discharge of gas has ceased. Under these conditions the silicon, the carbon and the copper are not attacked. They are collected by filtration, washed and weighed after calcination.

In order to ascertain the quantity of iron, I add to half the filtered liquid, including the water used for washing, not more than 10 per cent. of potash, sufficient to dissolve the aluminum, and leave it on the stove for half an hour. I collect, on a small filter without folds, the ocherous deposit which has collected at the bottom of the vessel. I wash it in hot distilled water and pour on the filter some drops of muriatic acid 5 per cent. pure, in order to entirely dissolve the contents. I recover a part of the acidulated liquid which has passed through the filter; then, as before, I add a proportion of potash. This is put on the stove, and when the deposit of oxide of iron thus extracted from the aluminum is well assembled, it is separated by the filter and washed to eliminate all traces of potash and weighed, after being calcined on a plate of platinum.

In the other half of the original liquid I find at the same time the aluminum and the iron, according to the regular process, by adding when warm a small amount of pure ammonia. By deducting from the weight ascertained the weight of the oxide previously obtained, I have the weight of the aluminum alone, and by calculation the proportion of pure aluminum.

The French industry actually furnishes aluminums which dissolve almost entirely, cold, in muriatic acid at 20 per cent., often leaving nothing but a very slight black deposit, scarcely appreciable in the scales. The silicon, the carbon and the copper have almost disappeared. The iron, which it is of not less interest to see disappear, has diminished considerably, but in this respect the progress accomplished is less marked than in the case of silicon. From $1\frac{2}{10}$ grams (18½ grains) which I found in 1891, it has only fallen to ½ gram (7¾ grains).

Aluminum Alloyed with Copper.—I put into two flasks ½ gram (8 grains) of the metal cut in small pieces, adding 50 parts of distilled water and only 5 parts of pure muriatic acid. The action is produced more rapidly than with aluminum alone. When the discharge of gas begins to abate the flasks are taken to the stove at a temperature below 200 degrees F., and they are taken off again when no more gaseous bubbles are observed. The operation lasts less than an hour. The copper remains absolutely intact in the form of a spongy, reddish mass. The contents of one of the phials is poured on a smooth filter and the deposit is washed in warm distilled water, calcined and weighed. In the filtered liquid is ascertained as before described the amount of iron and aluminum.

The other phial enables me to ascertain the presence of silicon or of carbon. With this object I add 25 to 30 drops of pure nitric acid and warm the liquid moderately over an open fire. In a few minutes all the copper will disappear, and only the silicon and the carbon will remain, which may be collected in a filter and weighed after washing and calcining.

Action of the Bunsen Burner.

In a lecture before the English Society of Arts, Prof. Vivian B. Lewis gives the following explanation of the action of the Bunsen burner of the cylindrical type :

In a Bunsen burner the chemical action which gives rise to the heating consists of two distinct combustions. The first takes place on the surface of the inner visible cone of the flame. Here the hydrogen and hydrocarbons of the coal gas undergo a partial combustion at the expense of the oxygen of the air, which has been previously mixed with the coal gas. This results in the combustion of the carbon to a mixture of carbon monoxide and dioxide, while some of the hydrogen is burned to water vapor. The outer flame is produced by the combustion of the hydrogen and carbon monoxide, escaping from the inner zone into the completed products of combustion, carbon dioxide and water vapor.

The characteristic appearance of the Bunsen flame varies according to the amount of air which is allowed to enter with the gas. Under normal conditions the zones of flame have a violet blue color, while as more and more air is allowed to enter with the gas the flame becomes fiercer and the inner zone acquires a green tint, and a still further addition of air causes the mixture to become so highly explosive that it flashes back into the tube of the burner. During this change in the color of the flame alterations are taking place in the temperature which the various parts of flame are emitting. The following table gives an approximate idea of the increase that takes place with the addition of more and more air, and which reaches its maximum as an explosive limit is approached :

Temperatures of Bunsen Flame with Blue and Greenish Inner Cones.

	Blue inner cone.	Greenish inner cone.
Tip of inner cone	1,090°	1,575°
Center of outer cone	1,533°	1,630°
Tip of outer cone	1,175°	1,545°
Side of outer cone, level with tip of inner cone	1,333°	1,511°

The ratio of gas to air in the blue and greenish non-luminous combustion is about—in the blue 1 volume of gas to 2.27 of air, and in the green 1 volume of gas to 3.37 of air.

The reason of this increase of temperature is that the less air that is supplied to the center of the flame the more has to be introduced from the exterior, and while the interior supply has been heated in its passage up the hot tube and by partial combustion in the inner zone, the outer supply is cold ; and as not only the oxygen which is used by the flame, but also four times its volume of diluting nitrogen, has to be heated, it is manifest that the less external air that is sucked into the flame the higher will the temperature of the external portion of the flame become ; and as it is this part of the flame which is utilized for heating incandescent mantles, it is clear that this will give a gain in the amount of light to be obtained from the mantle itself.

In the Bandsept burner it is possible to so regulate the mixture of the air and gas that not only is the green zone in the interior of the flame formed, but owing to the explosive point being reached it is drawn down on to the surface of the top of the gauze forming the atomizers, or mixers, through which, however, it is unable to pass. The flame then consists of what is, practically, only the outer cone of the ordinary Bunsen, and, being fairly homogeneous, has a greater equality in temperature than can be obtained with the ordinary flame.

THE RETAIL STORE.

The Monarch Blue Flame Oil Heater.

The Monarch Stove Company of Mansfield, Ohio, have made a radical departure in the way of oil heating stoves, and have brought out the Monarch Blue Flame heater,

The Monarch Blue Flame Oil Heater.—Fig. 1.—Drum Tilted Back for Lighting or Cleaning the Burner.

views of which are presented in the accompanying illustrations. We understand that the heater was placed upon the market last year, but in the rush to bring it out in time for the season's trade the manufacturers constructed

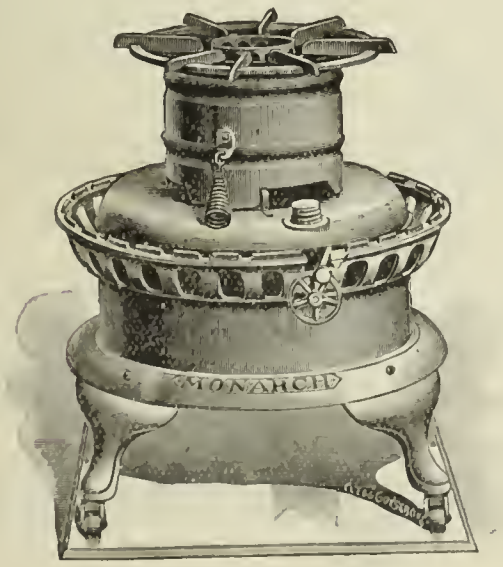
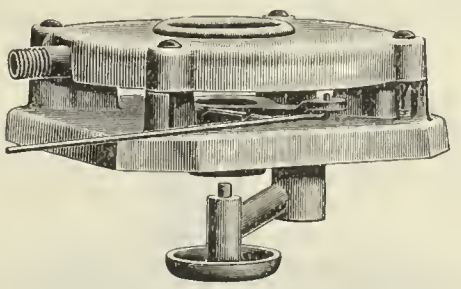


Fig. 2.—Stove with Drum Removed and a Grate Placed Over the Burner for Cooking.

it rather crudely, but now, having had a year's experience, they are placing the stove in the hands of the trade with some very important improvements, which, it is claimed, render it in every way desirable. The success of the blue flame burner on the many cook stoves that have been sold during the past two years makes the company feel certain that the Monarch heater, constructed on the same principle, will meet with a gratifying reception. In fact, they advise us that the sales of the stove thus far have been unusual, and that dealers are finding it profitable to handle by reason of the fact that "it is different from anything on the market." Fig. 1 of the illustrations shows the stove with the top tilted back for lighting or cleaning the burner, while in Fig. 2 the stove is shown provided with a grate for cooking purposes. The Monarch Stove Company are sending out a very attractively printed circular descriptive of this heater, and are said to be receiving a vast number of inquiries from the trade in regard to the stove. The latter is attractive in its general appearance and the combination of a cook stove with a heater is one of the points which cannot fail to command the attention of the trade.

The Van Duzen Oil Gas Burner.

In the accompanying illustration we present a genera view of a new form of oil gas burner which has been brought out by the firm of Van Dusen & Mersfelder, 437



The Van Duzen Oil Gas Burner.

Main street, Cincinnati, Ohio. The manufacturers claim for this device that it is always ready for use, is more economical than any other method of generating heat for furnaces, cook stoves, ranges, heaters or fire places, and that its simplicity is such that it may be readily installed in any kind of cooking or heating device without deranging or altering the latter, while its use avoids the necessity of handling coal, wood or ashes. In operating the device a small amount of oil is allowed to drip into the drip cup and lighted in the usual manner; the burning of this, heating the generator coil located under the top plate, produces a clear, bright gas flame, which is said to be free from carbon and of intense heating capacity.

Aluminum Hotel Saucepan.

The Griswold Mfg. Company, Erie, Pa., have lately added to their list of Erie cast aluminum ware a full line of hotel saucepans similar to the one shown in the accom-

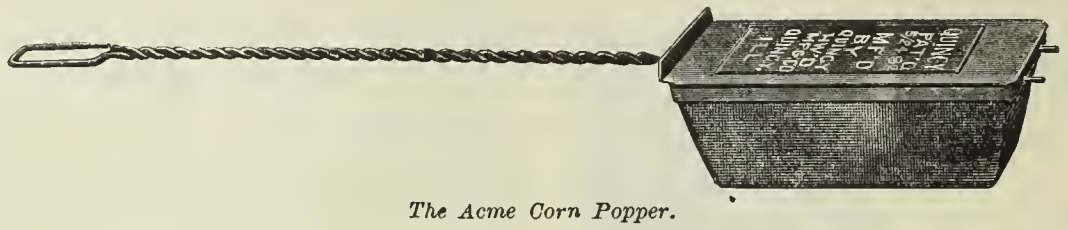
Aluminum Hotel Saucepan.

panying cut. These utensils are made in 12 sizes, of four diameters and three depths of each size. They are equipped with heavy iron tinned handles and cast extra heavy on the bottom to stand the rough usage of hotels. The method of attaching the handle to the body of the pan is a special feature. They are riveted by large rivets cast on the pans, leaving no joints to leak and no rivet

heads inside the utensil. These pans have been already put to use in some of the large hotels of the country, and the company have received very flattering testimonials indorsing them. Being cast they are very strong and stiff and will stand great heat and severe usage. They do away also with the necessity of being constantly retinned, which attaches to copper saucepans, while there is no poisonous substance in the metal. The Griswold Mfg. Company are just getting out a new catalogue of their full line of cast aluminum goods.

The Acme Corn Popper.

The Quincy Hardware Mfg. Company, Quincy, Ill., are putting on the market the corn popper shown herewith. It is made entirely of metal, including the handle, in full

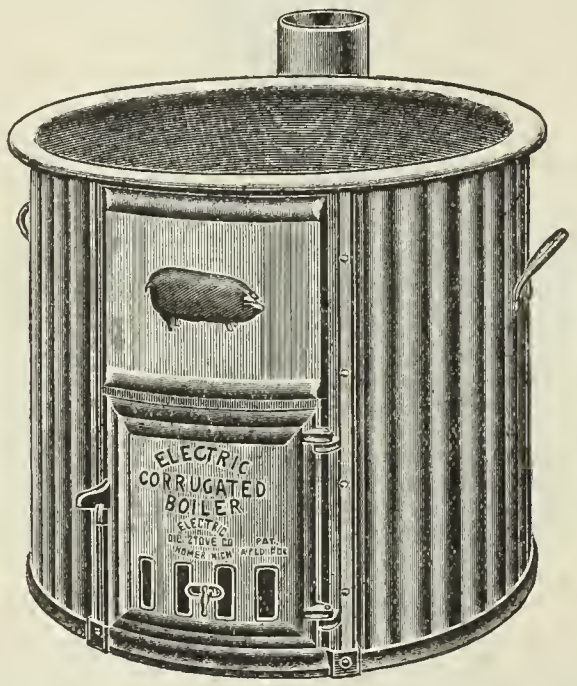


The Acme Corn Popper.

sizes 1 and 2 quart. The point is made that the handle cannot burn or come off. For shipping the poppers are nested 1 gross in a box. The popper is referred to as a good article which is sold for less money than their Quincy popper. The latter is shaken by a crank and gear attachment fastened to the handle. It is being made for 1897 with a solid tin lid, which, it is stated, will not fly off. Prices have also been reduced for this year.

The Electric Corrugated Boiler and Feed Cooker.

The Electric Oil Stove Company, Homer, Mich., are manufacturing the corrugated boiler and feed cooker



The Electric Corrugated Boiler and Feed Cooker.

herewith illustrated. It consists of a cast iron kettle supported on a very heavy steel fire box. The jacket of the fire box is corrugated, thus providing for expansion and contraction and insuring durability. The construction of the fire box is such that the heat is applied to the whole exterior surface of the kettle. The kettle is cast of the finest grades of iron and is specially designed for service and durability. The door frame is of cast iron and the door is large. Malleable iron handles are attached to the sides of the fire box. Three sizes are made, holding 40, 60 and 70 gallons respectively.

MEMORANDA.

We have received from the National Wringer & Mfg. Company, Canton, Ohio, their 1897 catalogue, in which they show their various styles of Wringers, with both malleable iron and wooden frames for attaching to the washtub. Their laundry furniture also includes a Folding Wash Bench with Wringer stand attached, and a Rack for displaying Wringers in stores. They are also manufacturers of standard Wood Faucets, which they say are made of the best dry butternut lumber. The last page gives a price-list of the parts for Wringers. Inclosed with the catalogue is an order blank to facilitate and simplify the work of making up an order for their goods.

Kemp & Co., Tinware manufacturers, 217 Elm street, St. Louis, Mo., have secured a lot 100 x 200 feet on the west side of Second street, where they will erect a new factory.

M. B. Kerr, Winfield, Kan., manufacturer of West's Stove Pipe Lock, advises us that this lock is now thoroughly introduced throughout the central West, and that a number of Eastern jobbers have recently taken the matter up with a view of introducing them through the Eastern States. In the advertisement of West's Stove Pipe Lock, which appears in this issue, the long disputed question as to whether or not marriage is a failure seems to be satisfactorily answered. These locks are packed 1 dozen in nicely labeled box.

J. P. Smith of the Fordyce Hardware Company, Fordyce, Ark., has sold his stock to J. W. Lee and Robert Graham. The firm name continues Fordyce Hardware Company, who will do a retail business in Shelf and Heavy Hardware Stoves, Tinware, Agricultural Implements, Sporting and Athletic Goods and Wagons. They have fitted up the handsomest brick building in Fordyce for the business, with new counters and shelving finished in hard oil, attractive in appearance and modern in style.

M. E. Lewis, who is successor to H. S. Marvin in the Hardware, Stove and Tinware business, at Orange City, Iowa, desires catalogues, &c., from the trade.

F. C. Boise of Union City, Mich., who has lately purchased the Hardware store of Buell & Spring of that place, would be glad to receive catalogues, &c., from manufacturers. Mr. Boise is carrying a stock of Shelf and Heavy Hardware, Stoves, Tinware, Implements, Bicycles, Buggies, &c.

Alfred Cole, Jr., whose Hardware store at 98 Fourth avenue, College Point, N. Y., was damaged by fire on the 13th ult., is continuing business at the old stand and is engaged in making a number of improvements. Mr. Cole would value copies of catalogues, price-lists, &c., relating to Hardware, Stoves, Tinware, House Furnishings, Mill, Factory and Boat Supplies, Plumbing, Roofing, Gas Fitting, &c.

L. S. Palmer has bought out the Hardware, Stove, Tinware, Implement and Sporting Goods stock of G. C. Fuller, Stoutland, Mo. and is continuing at the old stand.

J. F. Kimball, Gilroy, Cal., has been succeeded in the Hardware and Tinware business by A. Robinson. O. H. Dobbs has purchased his wall paper stock, and A. L. Ellis his stock of Implements and extras.

One of our representatives has recently been shown a new article of manufacture which will soon be brought to the general attention of the trade in an early issue. It is what will be known as No. 20 Ferrosteel special sad iron, and we understand its patents are controlled by the Ferrosteel Company of Cleveland, Ohio. It is a beautiful article, and the jobbers to whom it has been shown are very much taken with it, some of them expressing their intention of pushing its sale in place of other irons which they have been handling.

Ellsworth, Myers & Co., dealers in Hardware, Stoves, Buggies, Harness, Implements, &c., Decatur, Ind., have moved into their new store, which is two stories high, with basement. It is equipped with elevator and other modern appliances, and the firm advise us that they are now in good shape to handle their increasing trade. J. E. Ellsworth, the senior member of the firm, has been in business continuously in Decatur for the past 25 years, and is also the principal partner in the firms of J. E. Ellsworth & Co. and Ellsworth & Cline.

J. F. Johnson & Co., dealers in Hardware, Iron, Agricultural Implements, Stoves, Wagons and Wagon Material, &c., Greenville, Ala., have in course of erection a fire proof storage warehouse. The warehouse is situated on the line of the L. & N. Railway and covers an area 54 x 158 feet. This warehouse, in connection with the building they occupy on Commerce sreet, gives the firm a floor space of 11,400 square feet, which space, they advise us, will not more than meet the requirements.

J. D. Price and Samuel Johnson have started in the Hardware business at Bellflower, Ill., under the style of Johnson & Price. They are handling Shelf Hardware,

Stoves and Tinware. They are also doing a plumbing, steam and hot water and warm air furnace heating business, and in connection with this department are manufacturing Price's improved hot water Stove and the Bellflower Incubator, their own inventions. The stove is referred to as a combination hot water heater and radiator on one base.

Surprise Meat Chopper.

Peck, Stow & Wilcox Company, Southington, Conn., and 27 Chambers street, New York, have recently put on

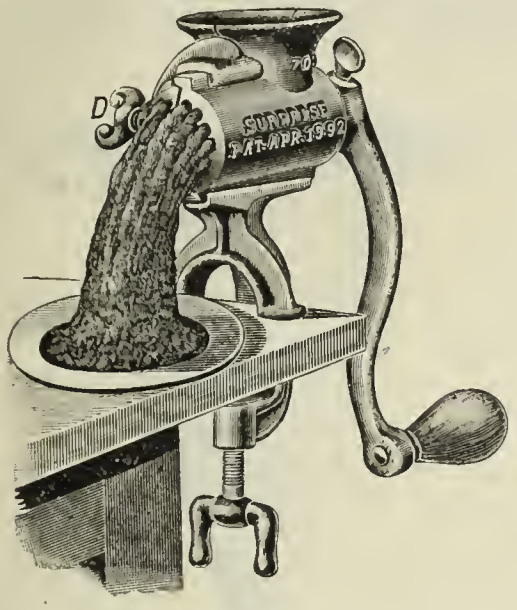


Fig. 1.—Surprise Meat Chopper or Food Cutter.

the market several new meat cutters of their manufacture, two of which are seen in the accompanying engravings. Fig. 1 shows the No. 705 Surprise meat chopper, or food cutter, as it appears in use. Fig. 2 illustrates the entire

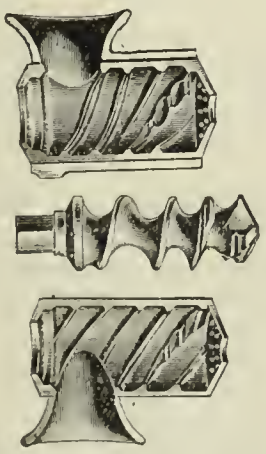


Fig. 2.—Working Parts Surprise Meat Chopper.

working portion of the cutter, which practically consists of the feed screw and shell, the parts being held together by the side thumb screw. The principal feature of this cutter, distinguishing it from others of their make, is

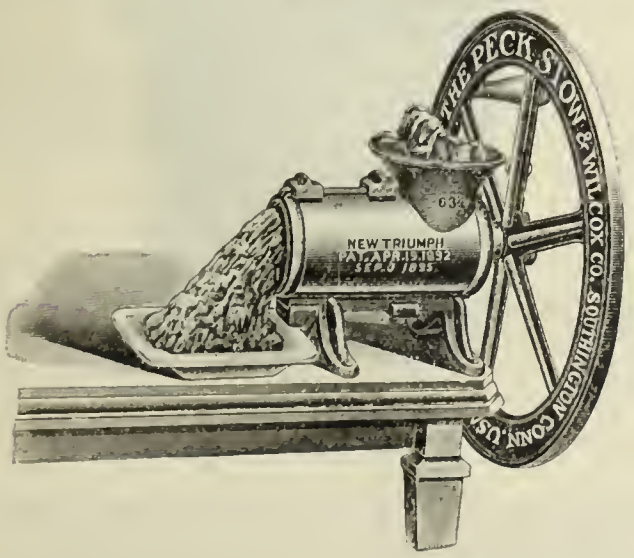
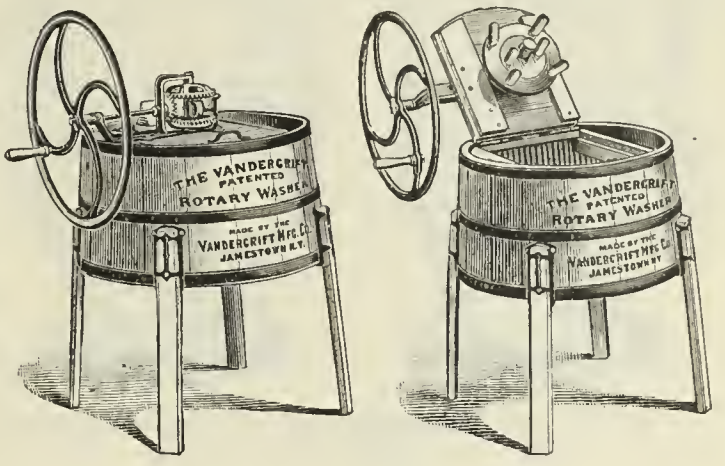


Fig. 3.—New Triumph Meat Cutter with Fly Wheel.

that instead of a detachable plate with holes at the delivery end the same result is accomplished by having the holes drilled in the ends of the two shells or body of cutter. It can be quickly clamped to a table or shelf. The parts are covered with two coats of block tin and it has a capacity of 1½ pounds of meat a minute. Vegetables and various other articles of food can also be cut with it, and when done with the parts can be instantly cleaned. At present it is made in but one size, for family use. Fig. 3 represents the No. 634 New Triumph meat chopper with fly wheel for sausage makers' and butchers' use, each weighing complete 48 pounds. They also make the same cutter worked with a crank, as are the smaller cutters. This is numbered 632 and weighs 21 pounds.

The Vandergrift Rotary Washer.

The Vandergrift Mfg. Company, Jamestown, N. Y., are manufacturing the washing machine shown herewith. It is so arranged that by turning the large balance wheel in one direction the dasher inside the machine reverses or rotates in opposite directions. The balance or fly wheel,

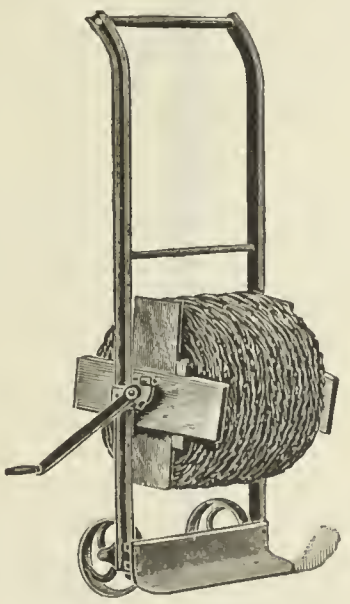


The Vandergrift Rotary Washer.

weighing 17 pounds, is referred to as being of great assistance in causing the washer to turn easily, and can be quickly removed when desired. The point is made that the machine is closed tightly to prevent the escape of steam and to retain the heat in the water; also that it can be operated with ease by any woman.

Farmer's Friend Steel Barb Wire Truck.

Warner Mfg. Company, Freeport, Ill., are introducing the steel barb wire truck shown in the accompanying cut. The truck is for use in building barb wire fence, to dispense with the method of carrying the spool of wire between two men on a stick, and to make the work safe and quick, with but one man to handle the wire. The truck is so arranged, it is shown, that the spool of wire may be picked up from the ground without touching it, and that when the truck is raised up in position the spool is locked in place automatically. The spool may be as readily removed from the truck without touching the wire. The



Farmers' Friend Steel Barb Wire Truck.

crank, which is furnished with each truck, is for use in taking down old fencing, so that the wire may be readily rewound on a spool ready for use, to avoid the loss from tangled wire when taking down in the usual manner. When the spool is removed the truck can be used, it is explained, for trucking grain, moving stoves, boxes, &c.

New Surprise Tubular Lantern.

The Ohio Lantern Company, Tiffin, Ohio, are placing on the market the tubular lantern shown herewith. It is of the standard size for coal oil, provided with a No. 1 burner, 5/8-inch wick and No. 0 globe. In Fig. 2 the lantern is shown open to light, trim, clean or to remove the globe. It can be opened or closed, it is explained, with one hand, and being smooth and perfect it is easy to clean. Every lantern, it is stated, is thoroughly tested and inspected by experienced workmen. The goods are packed in boxes of one-half or one dozen each.

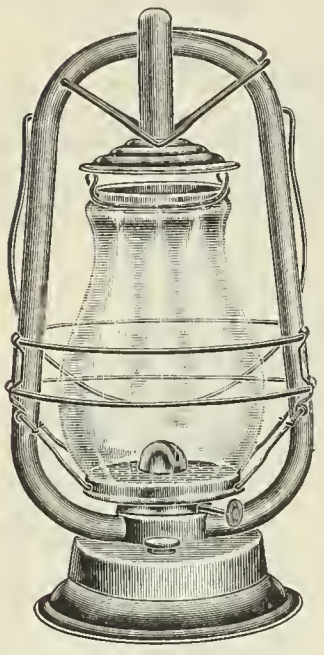


Fig. 1.—New Surprise Tubular Lantern.

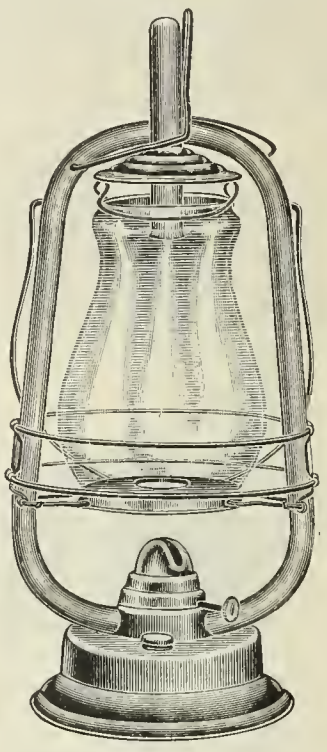


Fig. 2.—New Surprise Lantern Open.

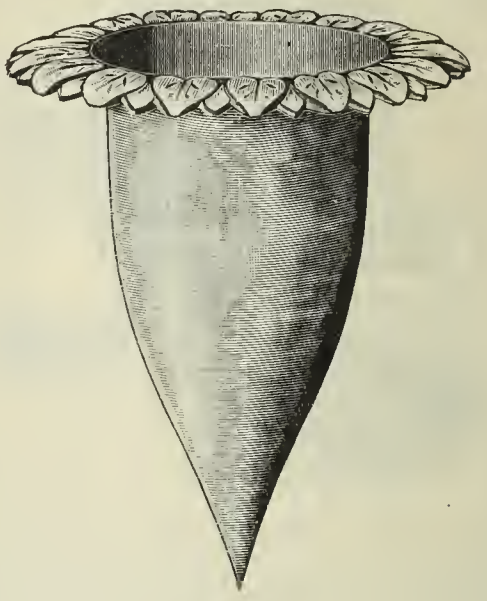
The Fast Mail Double Acting Force Pump.

The force pump illustrated herewith is manufactured by the Flint & Walling Mfg. Company, Kendallville, Ind., and is claimed to be most substantial and unique in construction. The set length, being very compact, can easily be inserted in casing as small as 5 inches in diameter, and is particularly adapted for use in deep wells of 2-inch and larger casing by submerging the cylinder the proper distance. The upper cylinder is made of seamless brass tubing, and, having one-half the capacity of the suction cylinder, a constant and rapid flow of water is insured. The air chamber is of adequate size to act in conjunction with both cylinders, thus insuring to the purchaser perfect ease of operation. Being fitted with hose connection on spout, the pump will be found quite convenient for use in greenhouses, sprinkling lawns, extinguishing fires, washing windows, carriages, and a variety of other purposes where a hand pump is required for forcing water to any desired point about private or public buildings. The pumps are furnished in two styles of finish, either painted or galvanized, as may be desired.

The Fast Mail Double Acting Force Pump.

Bouquet Holder.

The accompanying cut represents a bouquet holder for use in cemeteries, which is put on the market by the Wagner Mfg. Company, Sidney, Ohio. It is of cast iron, made in one solid piece, nicely finished and painted green. It is designed to be sunk in the earth about 1 to 3 inches from the top. The holder is 5½ x 6½ inches in size and contains sufficient water to preserve flowers much longer than if kept in tumblers, which are usually used.



Bouquet Holder.

The Economy Boiler and Feed Cooker.

The accompanying illustration shows the Economy boiler and feed cooker, manufactured by the Economy Mfg. Company, Homer, Mich. It consists of a furnace or jacket and a kettle. The jacket is made of heavy cold rolled steel, supported at the bottom by a heavy wrought iron band. Inside the casing is placed a cast iron flue, which conducts the fire against and around the kettle before the smoke reaches the smoke pipe. The entire outside of the kettle is brought in contact with the fire, and it is claimed that 50 gallons of water can be boiled in 20 to 25 minutes. The fire door is very large, enabling large pieces to be inserted. The kettle is of very smooth cast iron and can be lifted out of the furnace instantly. Three sizes are made, namely, 40, 60 and 70 gallons. The entire hight is but 30 inches, making it very convenient to dip into and out of.

The Economy Boiler and Feed Cooker.

Lizzie A. Reece has removed her Hardware and Stove stock from Walkerton, Ind., to North Liberty, where she is now located.

Stray Thoughts on Collections.

BY L. M. N.

The matter of collections engrosses not a little of the merchant's time and attention.

It is an unwise policy to

ALLOW CUSTOMERS

their own time in making payments. Even where the capital is ample and the merchant may not need to collect his bills promptly, not needing the money, it is best to have a system of collecting accounts when due, and of adhering to that system. Some may argue that it pays to allow debtors the privilege of paying when they get ready, where the capital of the business will permit. They may claim that it makes the house popular with the buying public, and is a means of securing and retaining business ; and that people do not like to be asked for money, and will patronize the house where they can have their own terms.

THIN SKINNED PEOPLE.

Now, while we may admit that there is some truth in this, and that it is a delicate matter to collect from some thin skinned people (in regard to their money obligations), and that in some cases offense may be given, yet it is not a sound principle of business to allow accounts to drag along after the time when they should be paid has arrived.

IMPLIED CONTRACT.

In the sale of a bill of goods there must be a contract between the buyer and seller. This contract may not be in writing or it may not be definitely expressed in words, yet it exists. The seller delivers the goods and the buyer agrees to pay for them at a future specified time. When this time arrives the buyer is expected to fulfill his part of the agreement. If he does not, then as a matter of business the seller should notify him and ask for payment. Now, there are some people who

DECIDEDLY OBJECT

to be reminded that they are owing a bill. Unless they are unusually good customers, who pay good prices and make voluntary settlements in a reasonable time, it does not pay to violate the system merely for the sake of satisfying such whimsical people. Some will recoil at the thought of thus driving away a customer. Perhaps a customer may be lost, and perhaps not. It does not do to be too modest in business ; rights must be maintained to a certain extent. If the matter is explained and it is shown that a system is followed in looking after all accounts that are due, if the person injured is at all reasonable his trade will seldom be lost. This will lead to a better understanding, and the customer may make some arrangement when he will be expected to pay in future, and then it is known what to expect of him.

SENDING STATEMENTS.

But the fear of offending is often more fancied than real. People as a rule expect to pay their bills and have no objections to the merchant sending them statements at regular intervals. In almost every case where people become angry because they are dunned they will prove to be undesirable customers. They take offense, or pretend to be offended, because they have been asked for such a degrading thing as money, and act as if the merchant should consider himself honored by having the opportunity presented him of selling them his wares. The good or bad opinion of such people counts for little.

THE PUBLIC

at this age of the century is too well informed of business methods to take offense at receiving a monthly statement of account. So we again repeat that it does not pay the retailer to be weak kneed in this particular.

A GOOD COLLECTOR.

Send out statements regularly every month or quarter, as may be determined which will best suit the business, and then follow up the statements. Let a polite collector call and the money will come in. There is a great deal in having a good collector. Some young man sent on this errand will do more harm than little. The main requisites of a good collector are that he should be always good natured, be able to make some pleasant or even facetious remark, persistent, and insist upon being told the exact date when he may receive the amount.

CUSTOMERS' EXCUSES.

It does no good to be cross and gruff if he is put off by such remarks as "Never got your bill," "Haven't checked your account yet," "Come in next week," or "I will call in and settle." These and other replies equally evasive are always fired at the new comer, and if he is a little soft he takes them for the solid truth, and thus makes his weary rounds, but fails to collect the cash.

The collector of opposite character who meets such a reception with pert and impudent replies is equally as unsuccessful, and does his employer positive injury as well. The former individual who is so easily "put off" is a great favorite with the people who are not fond of paying their bills promptly. They always meet him with a smile, and keep him calling until his successor is appointed.

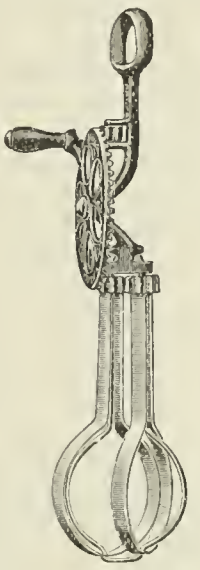
TACT IN COLLECTING.

It requires great tact to collect bills. These people are so polite and seem so anxious to oblige one with that little amount were it in their power, but Mr. So-and So promised them some money last week, but they have not got it yet, and they are actually filled with remorse and shame that they cannot possibly accommodate you to-day. The collector must be able to "size up" his man, and let him understand that though he may put off the other fellow, he has come to collect that bill.

When they find he means business they will pay him or give a date when they will, and in most every case they will do as they say, if the collector has grit and they realize that he will give them no rest until the bill is paid.

New Dover Genuine Egg Beater.

The egg beater shown in the accompanying cut is put on the market by the Dover Stamping Company, Boston, Mass. The improvement consists of a third or idler pinion or cog wheel, the sole purpose of which is to keep the large wheel from working loose and preventing the wear



New Dover Genuine Egg Beater.

on the gears occasioned by constant use, and the consequent slipping out of gear.

Wagner Mfg. Company, manufacturers of Cast Iron and Aluminum Hollow Ware, Sidney, Ohio, advise us that they have made arrangements with W. H. D. Mearns to be their resident agent in New York City and vicinity. Mr. Mearns was for some time the New York representative of the Griswold Mfg. Company. His office address is Room 10, 5 and 7 Dey street, New York City.

Rummel Brothers, Sioux Falls, S. D., issue circulars relating to Queen's Polishing Paste, useful for polishing stoves, silver ware, nickel and similar articles. This paste is manufactured exclusively by Rummel Brothers, and is put on stoves with a damp rag and brushed with a stove brush or rubbed with dry rags. The firm also make Nickel Polish, Bluing, Enameline, Japanese Varnish, &c.

Eb. Butler has bought a half interest in the Dan Henry Stove and Tinware establishment, Greensburg, Ind.

L. F. Currier, Allen's corner, Amesbury, Mass., has commenced the manufacture of a Stove Blacking, which he has named Congo.

Kalp & Mechling, Greensburg, Pa., made a fine display of Garland Stoves at the Youngwood fair.

Steiger & Kerr, Grass Valley, Cal., made an exhibit of their Stoves and Ranges, made in California, at the Mechanics' Fair, and secured three first prizes and one medal.

The task of keeping clean the downtown streets of Chicago has been intrusted by Mayor Harrison to a woman, Mrs. E. A. Paul of that city.

STOVE TRADE NOTES.

LACK OF UNIFORMITY IN STOVE FOUNDRY PRACTICE.

BY THOMAS F. KENNEDY.

An article printed in *The Metal Worker* of July 3 last cites a few instances in support of the statement that "The most striking characteristic of the stove foundries of this country is the prevailing lack of uniformity in method and practice." The closing paragraph of the same article says: "Circumstances and local conditions might properly modify practice, but this would only account for a small part; the greater part remains to be accounted for in other ways." It is my purpose now to inquire as to what may be some of the causes of this, outside of circumstances and local conditions. I attribute it to the entire absence of accumulated knowledge except in the form of tradition. If one examines a catalogue of any public library or of some of the publishing houses, books can be found treating of the minutest divisions and subdivisions of the different branches of the mechanic arts, commerce and agriculture. There is an abundant literature on the subject of founding, in the form of histories, treatises and practical works which cover a wide range. Much of this is the gradual accumulation of generations of experience and investigation. Especially is this true of other metals than cast iron, which did not begin to come into general use until the middle of the last century.

Except for the chapter on melting metals to be found in all of the books on foundry practice there is no information in them which is applicable to the stove founding branch of the art. The extensive literature devoted to the engineering branch of founding is easily accounted for. Inventors and engineers, civil and mechanical, as well as students in other branches of the mechanic arts, are all more or less interested in the theory and practice of founding; besides, architects and artists are often dependent on the founder for the success of their design, and to this extent are interested in what relates to founding. All of the earlier writings on founding were by scientists and inventors, though these were for the most part engineers by profession. It was very seldom that any of these men were bound to any one establishment either as owners or regular employees, hence they had no pecuniary interest in concealing any knowledge gained in their experience or through their investigations. On the contrary, they often gained name and fame by publishing it to the world, therefore they had all to gain and nothing to lose by so doing.

On the other hand, the men who built up the American stove business and made the principal improvements in design and methods of manufacture were either owners or part owners of stove foundries or regular employees of these with good salaries, and even if they had the time and inclination and were capable of doing this kind of work, from a pecuniary point of view they had little or nothing to gain, and it is possible that they were often rather inclined to keep a good thing quiet than to advertise it. Whether the true reason or not, this furnishes a plausible and sufficient one for the paucity of writings on the mechanical end of the stove business.

If calamities such as have destroyed civilizations in past ages were to overtake us now the making of stoves, so highly perfected in this country at the present time, would, so far as any writings go that would explain the mysteries of the business, be a lost art.

So far as I know the writings that would throw the most light on the mechanical end are the records of the proceedings of the manufacturers' organizations in the la decade, the papers contributed by members dealing with practical subjects or some phase of these, and the controversies and agreements between the manufacturers and molders. These latter, however, would be more interesting to the student of political economy or social science than to the scientist or the manufacturer.

Imagine the scholar of some future age translating a fragment of some record that refers to tamale stoves. The tamale, as some may not know, is a Mexican dish composed of beef, corn meal and cayenne pepper mixed together, formed into cylinders 1 inch in diameter and 5 or 6 inches long, wrapped in several thicknesses of corn husk and steamed. Our scholar of course would know in what high estimation the tamale was held by our Southern neighbors, and what more natural than the inference that the tamale stoves were to cook tamales?

There is a strong contrast between the numerous writers on foundry practice engaged in the machinery and jobbing branches and the almost entire absence of such among the mechanics employed in the stove business. The ambitious molder with an aptitude for writing, if engaged in the engineering branch of molding, has in an abundant literature an easily accessible mass of information which is an incentive to try his skill with his pen, and of immeasurable value as a guide and model in any work he may undertake in that direction. If writing an article on any current topic, he has a regular glossary of terms, phrases and definitions that are understood wherever the art of founding is known or practiced. If he is advocating a change in practice or formulating a new theory, he can furthermore easily learn how it agrees with the axioms of chemistry and natural philosophy as applied to the art of founding by the authorities from Overman down.

The stove molder has no such fund of knowledge to drawn on. If he undertakes anything in the line of writing he must depend on his own observation and experience to guide him. The tradition mentioned is often confusing and unreliable, and at best must be verified before it is of any practical value.

Another thing to consider is the uncompromising hostility of molders and other workmen to innovations or improvements, on the ground that sooner or later they would prove detrimental to their interests. This, of course, is done in a covert but nevertheless effective manner. A new hand may remark, "They have a better way of making this job at C.'s." Likely as not some one will reply, "Well, keep it to yourself. There is Rooter over there; when he came here five of that job he is making was a day's work. He told of a better way he saw a similar job made, and now he makes eight for a day's work—does nearly twice the work for the same money and keeps another molder out of a job." Out of deference to the wishes of shop mates I have on several occasions refrained from making suggestions to foremen or superintendents with a view to bringing about a change in practice on some point which, if adopted and enforced in a liberal spirit, would be sure to prove mutually advantageous. Observation and experience convince me that while it is to be deplored the prejudice has some foundation in fact. This prejudice minimizes the influence of what might otherwise be a considerable factor in bringing about more uniform practice, the traveling molder. I believe this subject of uniformity one well worthy the attention of stove men, especially of the leading spirits of their organizations.

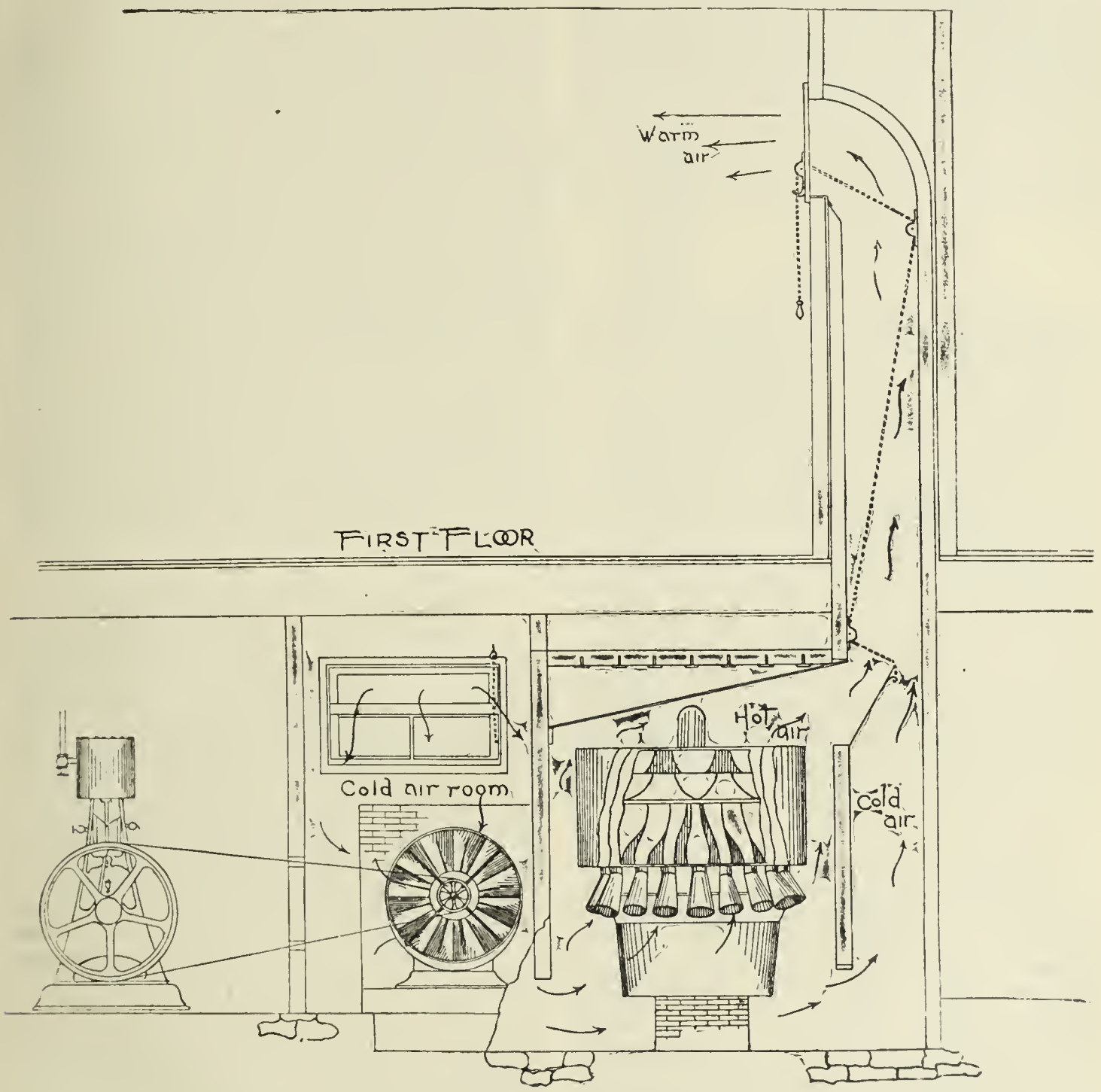
Oblivious of the fact that comparisons are odious, the Gobeille Pattern Company, Cleveland, Ohio, issue a cir-

cular in which they ask the recipient to make out a list of the six leading Stove manufacturers of 1877 and the six leading concerns in the same line to-day. Compare them and from the comparison be taught that nothing is so important as Patterns to the success of a house. This is the deduction of the Gobeille Pattern Company, be it remembered, but as they are in the Pattern business it is quite natural that they should so read history.

Furnace Hot Blast System.

A system of heating which has rapidly grown in popularity as its use and operation have become more generally known is what may be called the furnace hot blast system. Inquiring among the trade two years ago we were able to discover but a single example of this method of heating the details of the system as erected rather than on the principles involved. Since that time numerous furnace hot blast systems have been illustrated and described in *The Metal Worker* and much valuable information on the subject has been presented.

Among the early investigators in this field were the Smith & Anthony Company of Boston, Mass., and numerous systems are now in operation in which their furnaces have been used in connection with fans. One is in a large church in New York City, and others in churches and school houses in different cities in Connecticut and Massachusetts. In the accompanying illustration, which is reproduced from a catalogue entitled "Heating, Ventilation and Sanitation," recently issued by the Smith & Anthony Company, we present a sectional view through a building showing the arrangement of a furnace hot blast



Furnace Hot Blast System.

buildings, though at that time several systems were being installed in churches which had been planned by George W. Kramer, an architect in the Metropolitan Building, New York City. In all buildings where this system of heating was specified it was necessary for the architect to take all responsibility for its success or failure. The introduction of such a system was opposed in New York City by the insurance authorities. The first plants put in operation were contracted for by men who did entirely a heating contracting business, and were not in the ordinary sense manufacturers of furnace goods, furnace manufacturers being more or less doubtful as to the advisability of the use of a fan for forcing air through a furnace, and did not have at their disposal the information for the guidance of their customers in using furnaces of their manufacture in connection with a fan. The first system of this character which was brought to general notice was described in *The Metal Worker* of May 25, 1895, the article dwelling on apparatus. In this instance it will be noticed that a small engine is used to drive the fan, but it has been found in practice that an electric motor, a water motor, a gasoline engine or a steam engine is well adapted for the purpose. In some instances the fan is directly connected with the cold air supply duct, while in others it is set in a room supplied with cold air from out of doors by means of a window. The furnace or furnaces are set in the usual manner, although in some instances it has been thought beneficial to bring the casing of the furnace close to the heating surfaces, in order to force the rapidly traveling air to come in contact with the hot surfaces and to prevent it from passing through the furnace without being properly warmed. In the illustration presented it will be noticed that the system is provided with a mixing damper, so that in case the building becomes warmer than is desirable the temperature may be lowered by the admission of air of a lower temperature. The providing of a by-pass

and a mixing damper also enables the fan to be used in the summer season for cooling the building or changing the air.

In some instances, as has been shown by the plants which have been presented in *The Metal Worker*, the furnaces are set in one group or a battery, and the warmed air is carried to the different parts of the building by means of pipes. In other systems the furnaces have been placed at the base of a series of flues leading to the parts of the building which are to be heated, and some plants have been so arranged that they work either under the gravity or air blast system as occasion may require. It is noticeable that a gravity system will work better in cold weather, when there is a greater difference in the temperature and weight of a given bulk of air outside and in, than in the early fall and late spring, when the indoor temperature is but slightly in excess of that out of doors. Experience with this system of heating has demonstrated that the proper place for the fan to be located is between the air supply and the furnace and not between the furnace and the work to be done, as is the custom with blower systems of steam and hot water heating. Another feature which has been noticed, but which has been treated very conservatively, is that furnaces used in connection with a fan seem to develop their full heating capacity without any increase in the use of fuel, which is in opposition to an often expressed opinion among furnacemen that the use of a fan will bring so much air in contact with the furnace that it will be necessary for a larger size of furnace to be used in heating a given building.

H. H. Culver.

H. H. Culver, vice-president of the Wrought Iron Range Company, St. Louis, died at his residence in that city on Sunday, 26th inst., after an illness of nearly six months. Mr. Culver was born near New London, Ohio, in 1840. He received a common school education, and at the age of 21 years located in Springfield, Ill., where he was employed with the stove and hardware firm of McCreery & Co. In 1864 the Wrought Iron Range Company were established, whose business has since grown to mammoth proportions, the sales averaging a carload of ranges a day for the 365 days of the year. Mr. Culver has been identified with the Wrought Iron Range Company since their inception, and much of the success of this institution is due to the energy and general foresight which were among his chief characteristics. In addition to being a successful business man, Mr. Culver was also a practical philanthropist, giving away vast sums annually, all of which was dispersed without the least ostentation. In 1894 he established the Culver Military Academy at Marmont, Ind., now known as Culver, Ind. The academy is located on spacious grounds overlooking Lake Maxinkuckee, and with the exception of West Point is the largest military academy in the United States. The funeral took place Tuesday, 28th inst., the remains being temporarily placed in the receiving vault in Bellefontaine Cemetery, St. Louis, until arrangements can be perfected to inter them in the grounds of the Culver Military Academy, to rest among those he loved so well.

The March-Brownback Stove Company.

The annual trade catalogue which has just been distributed by the March-Brownback Stove Company of Pottstown, Pa., is something of a departure from the usual run of stove catalogues, and for that reason, if for no other, is likely to attract more than passing attention on the part of those receiving copies. The general shape is oblong and the 191 pages of letterpress are bound in heavy paper covers of deep blue, carrying in white enamel letters the name and address of the company and the number of the catalogue, 49. The printing has been executed with a great deal of care, and no little time and attention has been given by the compiler to the arrangement of the cuts and descriptive matter. For the most part the engravings appear on the right hand pages, while the major portion of the text occupies the left hand pages. The engravings are reproductions from photographs of the stoves, and in connection with the style of type used for the text present a very dainty appearance.

The stoves are divided into two classes—ranges and heaters. The ranges occupy nearly 100 pages of the volume, being offered under such names as the Welcome Globe, shown in a variety of styles and embodying the modern features of construction; the Victor Globe, a new design six hole range with nickel ornamentation; the Prize Globe, for coal or wood; the Solar Globe, which has been constructed with a special view of meeting the requirements of the building trade, and is therefore of special interest to builders, contractors, architects and all others engaged in the erection of buildings; the I X L Globe range, made either right or left hand, and the Prize Expert; a small six hole range of less weight and less elaborate detail than those already mentioned. The heating stoves are represented, with the latest production, the Bright Crown, in the place of honor. This is a handsome parlor heater, made as a single and double heater and adapted for hard or soft coal. Various styles of the Crown heater are also shown, after which we find the Palace air tight heater, an all cast iron stove of an entirely new design this season; the Polaris cannon stoves, the Puritan sheet iron circulators, made as single and double heaters; the Waldorf sheet iron surface burners, the Wood oval stoves, the Franklinite, shown in several varieties, together with an assortment of Junior Globe stoves, Victor hot plates, caldrons, furnaces, &c. Accompanying the catalogue is a circular calling attention to the heating and ventilating of schools and churches by the March-Brownback system, using the apparatus manufactured by the company named.

The Charter Oak Stove & Range Company,

with offices and sample rooms at Main street and Cass avenue, St. Louis, Mo., refer to the Charter Oak hard coal base burner and the Charter Oak soft coal air tight surface burner as "two modern wonders." The great points in connection with these stoves are their heating capacity and economy in fuel. The merits of the goods, together with handsome illustrations, are presented in an attractive circular which has just been issued from the press. The Charter Oak base burner is made in three sizes, with fire pots 13, 14 and 15 inches, respectively, and is fitted with flues which are not only large, but are so constructed and arranged that the heat is kept to the outer surfaces of the stove and is easily and quickly thrown into the room. There are two cold air flues at the back of the stove, so placed between the hot air flues that they draw the cold air from the floor and discharge it from the top in a highly heated condition. The heat from these flues may be carried to an upper room if desired. In the case of the Charter Oak air tight surface burner for soft coal the fire pot and dome are heavy solid castings, surrounded by an ornamental open casing, making the stove, as the manufacturers put it, a small furnace. Accompanying the pamphlet is a four-page folder, which is in the nature of a supplement to Catalogue No. 1, bearing date of July 1, 1897. This illustrates and describes the Charter Oak air tight heater for soft coal, the Charter Oak hard coal base burner, and the Royal Oak, a new parlor stove for wood and coal.

Stove, Range and Furnace Repairs.

The catalogue of stove, range and furnace repairs, together with price-list of hollow ware, sinks, stove dealers' supplies, &c., issued by the Henry Clark Company, 103-105 Blackstone street, Boston, Mass., consists of 188 pages, profusely illustrated and bound in black paper covers with embossed side title in silver letters. In the opening pages instructions for ordering repairs are given, and in order to facilitate the work and reduce the liability of error to a minimum sectional views of stoves are given with the various parts numbered, the figures referring to a table containing the correct names by which the parts are known. Illustrations are also given showing the position of a full set of brick and of various styles of grates. The list of stoves for which repairs can be supplied covers a little over 60 pages, the names being arranged in alphabetical order and preceded by figures which indicate the number of pieces of brick in a set. Following the list of stoves is given a list of manufacturers, together with copious foot notes. By special arrangement with the Smith & Anthony Company, the Weir Stove Company, Century Stove Company, O. G. Thomas and the Highland Foundry Company, all repairs for their goods are made by them for the Henry N. Clark Company. The latter are therefore enabled to offer repairs from the original patterns for all stoves, ranges and furnaces made by these concerns. The remaining portion of the catalogue is given up to a varied line of hollow ware, miscellaneous goods, price-lists, &c., the work concluding with an index alphabetically arranged.

"Things Wise and Otherwise" is the title of a short treatise on heating and ventilating by F. E. Browne, who makes a specialty of Furnace Heating at 123 East Fourth street, Los Angeles, Cal. The book contains a half-tone engraving of Mr. Browne, followed by cuts of the Furnace made by him and some of its inner parts and his method of piping. Interspersed on pages between the cuts are comical pictures to illustrate points he makes for his Furnaces, and accompanying them are rhymes and other humorous matter which cannot fail to interest the buyer, as they bring forcibly to his notice the features of excellence which Mr. Browne claims for his Furnace. The last pages are devoted to a long list of people in Los Angeles and nearby cities in whose buildings he has installed heating systems.

ODD PLATES.

The Westchester County Fair for 1897, held at White Plains, N. Y., was well attended, and among the many things to admire was the display of Andes Stoves and Ranges made by Fowler & Sellers, White Plains. Among the Ranges shown were the Grand Andes, Royal Andes, Glen Andes, Lake Andes and New Grand, made by Phillips & Clark Stove Company, Geneva and Troy, N. Y.

"The Stove Repair Season Is Now at Hand," is the headline on a card in reference to Stove repairs received from J. Elwood Yeager, 56-58 North Second street, Philadelphia, Pa. The card also bears four pictures on the corners. One corner represents a dealer who does not get his Stove repairs promptly and at the proper prices, and below it is a picture of his office showing his order file nearly empty. On the opposite corner is a view of the dealer who buys at the right prices and gets his goods quickly. Below is a view in his office showing his order file filled with correspondence and an open order book written full of orders. It is needless to say that the balance of the card is devoted to the Stove Repair business, with a solicitation that orders be sent to the address given above.

Henry H. Gurnsey of New Haven, Conn., has the contract for setting 29 of the Royal Hot Air Furnaces, made by the Hart & Crouse Company, Utica, N. Y.

The Neenah Stove Works, Neenah, Wis., who had been running four days in the week, began running five days in the week last Monday.

The Lehigh Stove & Mfg. Company of Lehighton, Pa., are favoring their friends in the trade with buttons mounted on pins, and bearing upon their face the words "Lehigh Stoves." This is one of the many forms of advertising novelties which are being employed by stove manufacturers to keep constantly before the trade the names of their goods.

About January 1 a company will be formed and incorporated, with a capital of $50,000, to manufacture Stoves and other Castings in the plant formerly operated by the Perry Stove Company and later purchased by John E. Gaitley of the Troy Nickel Works, Albany, N. Y. The new concern will be known as the Albany Foundry Company, and a general jobbing department will be run in connection with the Stove end of it.

Graff & Co., Stove manufacturers, of Pittsburgh, Pa., will not remove their Stove plant from New Castle, Pa., to Remington, Pa., as reported. The concern were made an offer by a land company at Remington to remove there, but declined it.

The Peck-Williamson Heating & Ventilating Company, Cincinnati, Ohio, issue a large colored poster presenting a broken view of the Ideal Heater and Ventilator. The cut shows the Heater with pipe running through an upper story, with the warm air register and foul air duct and the chimney cap on top of the roof. By means of a broken view the construction of the Heater and the flues may be clearly understood.

The Ideal Foundry Company, Daleville, Ind., made their first heat on Wednesday evening, September 1. A local paper in speaking of the event states that although some of the fixtures were not in first-class order the heat was a complete success and everything now is moving along in the best of order. "Few factories," the paper states, "have ever started in the gas belt with brighter prospects before them. Orders are pouring in despite the lateness of the season, and there will be no trouble for this foundry to dispose of all the Stoves they are able to manufacture."

Last Saturday night a fire broke out in the foundry of the Detroit Furnace & Heater Company, Detroit, Mich., doing damage to the amount of several thousand dollars. The company, however, were only temporarily embarrassed, and they expected to resume business in a few days.

The Pittsburgh Reduction Company, New Kensington, Pa., are now drawing a Nickel Aluminum Wire, which is claimed to be much stronger than the Wire made from the pure metal. It is used for hair pins and for purposes in which an unusually stiff wire is required.

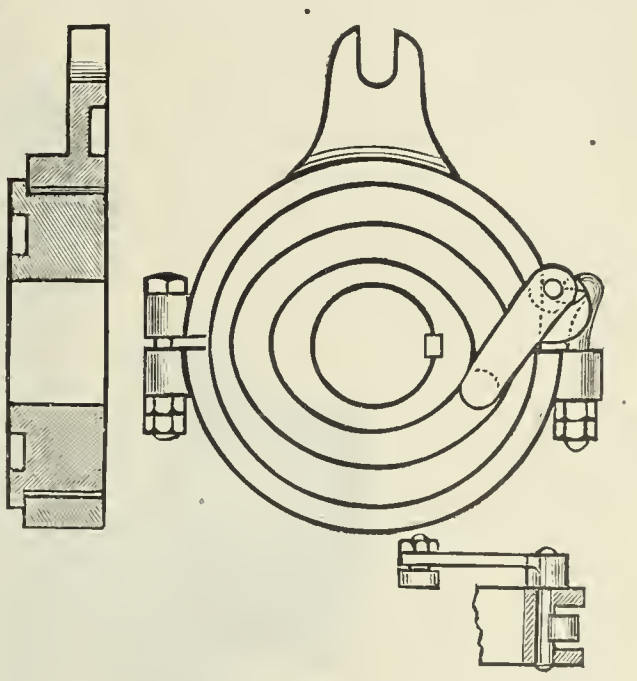
A dispatch from Berlin says that the German naval estimates to be presented by the Admiralty will be quite moderate. A programme drawn up by direction of the Emperor provides 50,000,000 marks for navy purposes for the coming year, and 60,000,000 marks for the next year's expenses.

Norman Whitelaw, who has been traveling salesman for the Richmond Stove Company, Norwich, Conn., for several years, has resigned to accept the position of contracting engineer with the H. R. Barker Mfg. Company of Lowell, Mass.

The Crosby Automatic Friction Brake.

A new automatic brake for power presses is herewith illustrated. It is intended to prevent the sudden reverse motion which would otherwise be communicated to the cross head when operating dies that are constructed with powerful steel or rubber springs under the lower die. Unless overcome or balanced in some manner the cross head, or slide, after being released from the pressure of the downward stroke would be driven up so forcibly as to probably break or derange the mechanism of the clutch, or by carrying it past the highest point before the clutch had caught on would allow it to descend again by its own weight, making accidents much more liable to occur.

The brake here illustrated acts automatically and only at the time required to prevent a sudden acceleration in the motion of the cross head, which is from the time that the punch and cross head start upward until the punch leaves the drawing ring, usually about one-quarter of a revolution of the shaft, thus leaving about three-quarters of the revolution of the shaft open or free from the friction or use of power. This device is manufactured by G.



The Crosby Automatic Friction Brake.

A. Crosby & Co., 176 and 178 South Clinton street, Chicago. It may be applied to any of their presses when desired, but is more particularly recommended for machines which are to operate large combination and drawing dies.

The Bureau of the International Postal Union at Berne, Switzerland, has published the annual report of the postal and telegraph business of the countries of the world for the past fiscal year. It contains an official statement of the receipts and expenditures of the various postal departments which is of interest. For the six leading countries these figures are as follows:

	No. of offices.	Receipts.	Expenses.
Germany	30,115	$97,360,000	$93 900,000
United States	69,912	79,775 000	89,940,000
G eat Britain	20,116	57 325,000	40 400,000
France	7,812	44,980,000	34,800,000
Russia	7,432	32,060,000	23,320,000
Austria-Hungary	9,859	32,740,000	31,040,000

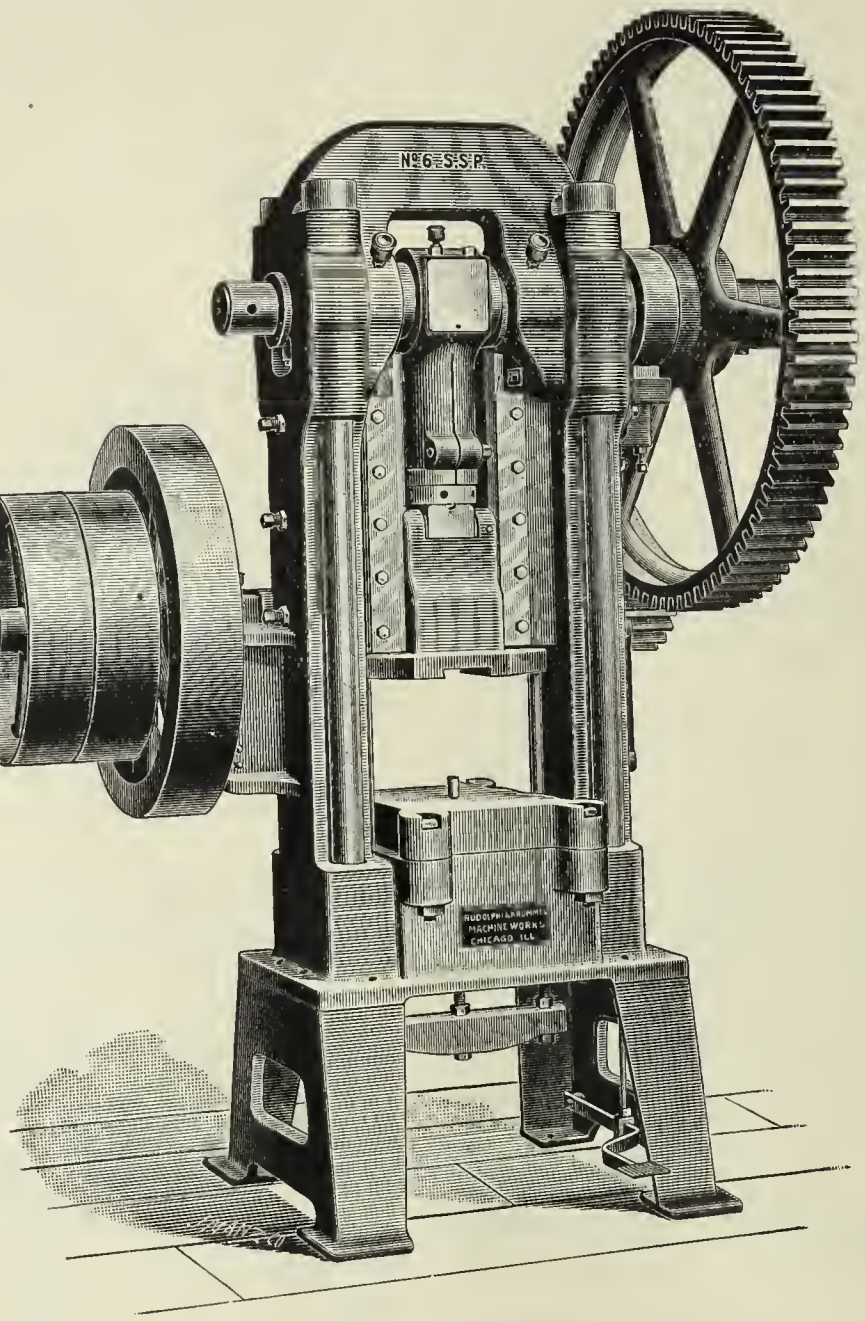
Among the smaller countries, the receipts of Italy were about $10,000,000, Japan $6,000,000, Switzerland $5,000,000, Spain less than $5,000,000, Belgium $4,000,000, the Netherlands $3,000,000 and Sweden and Norway a little less than $3,000,000. Every country, except the United States, is shown to derive a net revenue from its postal service.

About 8,500,000 workers in Great Britain are dealt with in the fourth annual report of the Labor Department of the British Board of Trade, just published, and covering the year 1896. Of these, the report indicates that only about 607,000 were affected in their wages. The general tendency in this respect was upward, 382,825 persons having had their wages raised and only 167,357 had theirs decreased, while there were temporary changes, up and down, in the case of 58,072 more. The net result of all the changes was an average rise of 21 cents a week. In the building trades the advance was 50 cents a week and in the metal, shipbuilding and engineering trades 27 cents a week. The hours of labor in 1896 were changed in the case of 108,271 individuals, the changes representing an average reduction of three-quarters of an hour's work a week for each person affected.

Rudolphi & Krummel's Straight Sided Press, with Tie Rods.

In *The Metal Worker* of June 5, 1897, an illustration and description were given of the regular straight sided line of presses manufactured by the Rudolphi & Krummel Machine Works, 96 to 100 North Clinton street, Chicago. A modification of these presses has now been brought out by the same makers, which is herewith illustrated. The modification consists principally in strengthening the presses with cold rolled steel tie rods. These rods are shrunk in the body casting in such a way as to place them under a predetermined strain proportionate to their section. It is well known that cast iron is not a very suitable metal for heavy tensile strains, particularly in castings of large sections, which are always more or less coarse grained and spongy in the center. The tie rods are, therefore, a desirable feature on presses intended for heavy work. The shafts of this style of presses, owing to their usually limited stroke, are generally made with an eccentric, as shown in the cut, thus affording an opportunity to support them closely up to the connection to avoid spring.

The clutch on these presses is provided with an additional set of locking pins, arranged in the gear or fly wheel. These pins serve to take up all backlash between the clutch pin proper and the gear, thus overcoming any rebound or shock experienced on the passing over of the lower center in doing heavy work. This new feature results both in a large saving of power, as the friction need not be set up tight, and also in a reduction of the wear in the different parts of the press. For setting the dies, these pins are pulled out and kept out by turning them a quarter of a turn, thus giving a sufficient amount of play, necessary for facilitating the setting. These presses are being built in six sizes, weighing up to 18,000 pounds.



Straight Sided Press, with Tie Rods.

Electricity and the Growth of Plants.

Experiments made lately by A. S. Kinney, an expert electrician, at the Massachusetts Agricultural College are reported to have demonstrated that electricity is a real incentive to the growth of plants. He submitted different seeds to the action of an electric current and found that germination was much accelerated. The experiments and their results are thus described: Two lots of 12 groups, containing 112 seeds each, were soaked in water until thoroughly moistened, and then placed while wet in glass cylinders, open at either end. Copper disks, which were connected to the two poles of an induction coil, were pressed against the seeds at each end of the cylinder and a current passed through them for two minutes. After this the seeds were sown, the temperature being kept at 45 to 50 degrees. The result was an increase of growth in the seeds to which electricity had been applied over the seeds not so subjected of 30 per cent. The results showed that electricity exerts an appreciable influence upon the germination of seeds ; that the application of certain strengths of current to seeds for short periods of time accelerates the process of germination. Seeds subjected to but one application of electricity show the effect only for a few hours, while electricity applied hourly to germinating seeds acts as a constant stimulation to their growth and development.

A copper pan, said to be the largest ever made from one piece of metal, has been turned out lately at Swansea, Wales. It is 12 feet 4 inches in diameter, 3 feet 3 inches deep, and weighs 2 tons.

An exceptional degree of activity is noted among the industries in the Indiana gas belt. More than half of the iron, glass and tin plate works are now running night and day.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Unusually heavy importations from primary points and from Europe have overshadowed other market conditions and forced wholesale prices down a fraction. The decline, however, was far short of what some observers (not dealers) have looked for, and the statement is warranted that the bulk of the importations were well taken care of in one way or another, although they have exceeded the estimated consumption for the month by several hundred tons. The current demand has fallen off somewhat, consumers and dealers being well stocked up by late liberal purchases. Retail prices are unchanged, small lots of Straits Pig from store selling at 14¾c. per lb.

Copper.—Export movement has continued on a scale that is surprising even to the most hopeful dealers, and a quiet business of very good volume has been effected with home consumers also. In short, the outward movement has kept well in pace with the heavy production and served to prevent any fall in values, despite very tame, bluish tinted reports from the speculative branch of the London market. In a small way the run of orders has been fair and prices firm, jobbers quoting Lake Ingot at 12¼c. per lb. and Ansonia Grade Casting at 11¼c.

Sheet Copper.—The general condition of the market for Manufactured Copper remains practically the same as for the past few weeks. Prices are firm in sympathy with the strength in raw material. The demand for Sheet Copper is little above the average for the season, and is curtailed to some extent locally by the strike in the cornice makers' trade. Nevertheless the aggregate of business for September seems to have compared favorably with that done in the same month of 1896, and the outlook for good trade is regarded as promising. Jobbers quote about 15c. per lb. basis on small lots of Sheet Copper from stock.

Pig Lead.—Operations have been moderate in this quarter, although reported large in the West, but the market has gained rather than lost in tone and wholesale prices are a trifle higher than a week ago. The consumptive demand in retail lines was very moderate and scarcely up to the average. Nevertheless jobbers' prices are firm at 4⅝c. to 4¾c. per lb. for American Pig in small lots from store.

St. Louis advices are as follows: The market for Pig Lead is quite active and some liberal purchases have been made. Sellers are looking for an early advance. They claim there are practically no stocks in the country, and that consumers have been buying from hand to mouth.

Spelter.—Firmness of more pronounced character has developed here, particularly in the instance of metal that consumers can work satisfactorily, and some increase in sales has taken place. Eastern consumers are still very conservative buyers, however, and the firmness of the market is due chiefly to more or less liberal purchases in other directions. Business in a retail way has been rather quiet, but prices show no change. For small lots of good Western Spelter 4¾c. to 4⅞c. per lb. is asked.

Advices from St. Louis are as follows: There is no change to note in this metal. Consumers are not disposed to anticipate their wants, appearing confident that an advance in Spelter is out of the question.

Antimony.—Sales have been fair and prices are steady at about 8¼c. to 8½c. for Cookson's, 7¾c. to 8c. for Hallett's, and 7¼c. to 7½c. for Japanese in small parcels.

Tin Plate.—The leading factor of the week in the Tin Plate market was the difficulty experienced by the mills in obtaining a sufficient supply of Steel Bars. This has obliged some of the mills to curtail their operations, notwithstanding that their order books are well filled. It has further increased the delay in deliveries to consumers and dealers on old contracts and made still more pronounced the difficulty the latter find in getting orders filled for spot goods. Most of the mills are away behind in their shipments, and the situation in this respect becomes more marked as time goes on. Were the demand for Tin Plates anything like as heavy as it was expected to be, there would be a famine in certain lines. As it is, the scarcity in 85, 90, 95, 100 lb. and full weight Cokes is causing no little inconvenience. These Plates, when they can be secured for spot delivery, are eagerly snapped up at a substantial premium. A quite large business has been effected during the week in American Cokes for more or less distant future deliveries at prices averaging from 2½c. to 5c. per box advance over the late ruling quotations. Spot goods and early deliveries command as high as 10c. to 12½c. advance Stocks of all kinds of Plates are extremely light, and the market, as a whole, seems shaping toward a higher level of prices all around. Jobbing business, as is usual at the close of the quarter, was rather light. The demand for Roofing Plates was especially disappointing. Quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs , $3.30 to $3.40; American Charcoal Brights, Melyn grade, IC, 14 x 20, $4.55; Allaway grade, IC, 14 x 20. $4 15; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates sell slowly, but being in light supply are held very firmly.

A special London cable dispatch of September 29, 1897, reports on the British Tin Plate market as follows : "Tin Plate for home trade quiet. Fair orders have come in for selected Cokes for Canada, and there is more demand from Russia, owing to the approaching close of the shipping season. Stocks at shipping point are returned as 55,000 boxes. We quote ordinary 14 x 20 Bessemer Cokes at 9s. 4½d. to 9s. 6d. at Swansea."

Sheet Iron.—The demand for Black Sheets direct from mills is very active. Manufacturers' books are filled with orders, and in many cases it is found impossible to obtain early deliveries. It has been a long time since the mills had as much tonnage booked as they have at present, and the outlook for steady operation for the winter is extremely encouraging. Prices continue very firm, and if demand continues and another advance in Steel takes place an advance in Sheets is probable. Galvanized Sheets are also moving very briskly, the aggregate volume of orders being larger than for a long time past. Locally, the demand has been cut short owing to the strike in the building trade. Prices are very firm for small lots here. No. 27 Common Black Sheets in small lots from store are quoted at about 2.40c. per lb. and Galvanized Sheets at 75 and 10 and 5 per cent. off.

Chicago advices are as follows : Occasional orders are being received for carload lots of Black Sheets, but the demand is not very large. The mills, however, are so full of work that carload business is falling into jobbers' hands. Galvanized Sheets are selling much more freely, the demand still coming from all classes of consumers. It is somewhat remarkable, in view of the heavy demand, that prices do not advance sharply. Small lots of No. 27 Black from stock are selling at 2.25c. to 2.30c. and Galvanized at 80 to 80 and 2½ per cent. off.

Old Metals.—The demand is increasing, and prices are strong with an upward tendency. Dealers here are pay ing about the following rates :

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¼c.
Light Brass	per lb. 4¼c.
Lead	per lb. 3¼c.
Tea Lead	per lb. 2¾c.
Zinc	per lb. 2 c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10.00 to $10 50
Heavy Cast Scrap, per gross ton	$9.00 to 9.50
Stove Plate Scrap, per gross ton	5.50
Burnt Iron, per gross ton	4.50

The St. Louis Aluminum Casting Company, St. Louis, Mo., have lately been organized to do general foundry work in aluminum under the patents of L. J. Crecelias. By the newly invented process it is claimed that absolutely sound, hard castings can be obtained, suitable for many purposes for which aluminum heretofore has been thought to be too soft a metal. The offices of the company are at 815 South Seventh street, St. Louis.

The gold production of the Witwatersrand mines of the Transvaal, in South Africa, shows a steady increase. During the first eight months of 1897 the total production was 1,890,513 ounces, as against 1,468,695 ounces for the same period of last year.

THE IRON MARKET.

The past week has been rather quieter in the Central West, but there are numerous indications that the tide is rising in the Eastern markets where the trade has been more conservative and has been inclined to wait until the pressure of distant competitors is clearly withdrawn.

The Pittsburgh market for Bessemer Pig has been rather quieter. It is reported, however, that a large Steel company who produce a very large quantity of Pig Iron have bought about 30,000 tons to cover a deficiency, and now comes the report of labor trouble at the plant of a large consumer in the Pittsburgh district.

Billets have been quiet, relatively, but are very firm, with a growing scarcity of Sheet Bars which is beginning to tell on the Tin Plate market. No very large transactions in Finished Iron and Steel have been closed during the week, but there is a heavy run of small orders in nearly all lines.

In Foundry Pig Iron there has been a lull, but the increasing strength of the market is shown by the fact that the Southern furnaces will not quote under $8 for No. 2 at Birmingham for 1898 delivery, and by the announcement that the Eastern Pig Iron Association has decided to hold to $10.50 for No. 2 Plain and $10.75 for No. 2 X at furnace.

Pig Iron.—The market in New York has been less active, but the undertone continues strong. The advances in the Southern markets are carrying the prices of that section, delivered here, closer to those which have been current for metal produced in Eastern Pennsylvania. The leading producers in the latter section have announced prices which are equivalent to $11.40 for No. 2 X, and $10.90 for No. 2 Plain. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.40 to $11.50; No. 2 Plain, $10.90 to $11. Southern brands, same delivery: No. 1, $11 to $11.25; No. 2, $10.50 to $10.75; No. 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

In the Philadelphia market the situation as regards Pig Iron seems to be growing stronger. The demand has been very large. Some holders have advanced their prices about 25c. per ton, but a still larger number have withdrawn from the market on the ground that they have all the business they ought to carry until things become more settled. It is also a noticeable feature that Irons which usually come to this market are now diverted toward the West, prices in that direction being more favorable than in the seaboard markets. It is difficult to quote a market of this kind, as prices paid within a few days past are no criterion of what may have to be paid to day or during the balance of the week. Sales were recently made at about $10.50 for No. 2 Plain and $10.75 for No. 2 X, but inside figures to-day would be 25c. advance, and in most cases 50c. advance would be quoted. The average range for seaboard deliveries, however, is about as follows, and 30c. to 50c. less at points within a radius of 100 miles south or west, according to freight rates: No. 1 X Foundry, $12 to $12.50; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75.

Business in local Iron in Chicago is somewhat better than during the past two weeks. The orders recently taken are estimated to have been fully up to the shipments made for the week. The demand for Southern Iron has, on the contrary, been rather light. The large companies are practically out of the market for the remainder of the year, but other Southern producers are in a position to take considerable business. Prices, however, are very firm and a further slight advance has been made on Nos. 2 and 3 Foundry and No. 2 Soft. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.00 to 12.00
Local Coke Foundry, No. 2	10.75 to 11.50
Local Coke Foundry, No. 3	10.25 to 10.50
Local Scotch, No. 1	11.00 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10 35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

As far as sales are concerned the market for Pig Iron in Pittsburgh has been quieter this week than last week, but prices are fully as strong and are higher. The more conservative element believe that prices are about high enough, and it would be much better if they could be held where they are. Foundry Irons are very firm. We quote as follows, f.o.b. Pittsburgh: No. 1 Foundry, $10.50 to $10.75; No. 2 Foundry, $10 to $10.25; No. 3, $9.50 to $9.75: Bessemer, $10.75 to $10.90.

Reports from the Cincinnati market indicate that the advance of last week was sufficient to check the buying movement so far as large transactions are concerned, but there has been a steady swell in the smaller trade which has been very gratifying. The volume of inquiry is still very good and a continuation of present conditions is expected for the next week or so at least. The buying has been good all along the line, the mills showing by their orders that their trade is looking up materially. Full prices have been obtained on most of the smaller sales, but on the whole prices have been rather irregular. The market closed strong with the indications that quotations will be more regular and better sustained. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled Forge	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The St. Louis Pig Iron market is quite active and a number of fair sized sales have been recorded during the past week. Furnaces are not disposed to take orders except for prompt shipment, and for deliveries later in the year are asking advanced prices. The scarcity in No. 1 Foundry continues and $10.50 to $10.75, f.o.b. cars St. Louis, is the ruling quotation to-day for this grade. An advance of 25c. per ton on all grades is expected before the middle of October. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.50 to $10.75
Southern, No. 2 Foundry	9.75 to 10.00
Southern, No. 3 Foundry	9.50 to 9.75
No. 1 Soft	10.50 to 10.75
No. 2 Soft	9.75 to 10.00

CHICAGO REPORT.

Scrap.—The market is becoming more active. Consumption is rapidly increasing. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$8.50	....
Machinery Cast	7.00	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	4.50	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.00	....
Old Boilers (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	10 c.
Copper Bottoms	....	9 c.
Copper Clips	....	9¾c.
Red Brass	....	8 c.
Yellow Brass	....	7¼c.
Light Brass	....	4¼c.
Pipe Lead	....	3¾c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	½c.

Anthracite.—The demand is not very large, the weather being too mild to influence business. The price on carload lots of 12 tons minimum is now as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7 60
Council Bluffs, Iowa	7.35	7 60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8 60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

The British Admiralty have recently placed an order with the Fairfield Shipbuilding & Engineering Company for the construction of a 30-knot torpedo boat destroyer.

THE HARDWARE TRADE.

The Hardware market presents few new features. The demand continues in about the same volume as for the past few weeks, but the current business has more of a distributive character, jobbers having pretty well covered their immediate requirements and being now well occupied in filling the orders of their customers. There is thus a slight falling off in the demand upon manufacturers except in a few lines, principally in the way of Heavy Hardware where special conditions encourage continued and more liberal buying. In prices there is little new to report. The market is steady, and in a few lines there is a perceptible tendency toward somewhat higher prices. In a good many kinds of goods there is a withdrawing of extreme discounts, while it is not feasible to make any actual advances. The most encouraging features which have characterized the business situation still continue, and there is a decidedly hopeful feeling prevalent among the trade in all parts of the country. The good prices ruling for farm products are putting the agri cultural classes in excellent condition. and the trade is beginning to feel the influence of their increasing prosperity. There is little doubt that this improvement in trade will continue, while the full effect of it will not be manifested until after the opening of the new year.

Advices from Chicago.—A healthy trade is in progress in Shelf Hardware. The volume of business keeps well up to the average of the past few weeks. The character of the trade is of course changing with the advance of the season, but while the demand for some articles has fallen off, a better movement in others is fully supplying the gap. Staple goods are going out very freely, advances in price having stimulated buying even of such articles as may not be in immediate demand by consumers. Many buyers are of the opinion that the trade is now in for a long upward movement, and that it is a good time to lay in stocks on which nice profits may later be realized. The movement of Tinware is not quite so vigorous as earlier in the month. Jobbers, however, look for a revival of the demand before the middle of October. It is expected that by that time the advent of cooler weather will cause a brisk demand for Elbows, Stove Pipes and other Sheet Metal seasonable goods. Tin Plate is still scarce and hard to get, especially for early delivery. Jobbers have had a demand during the past week for Black Sheets from stock, needed by large consumers who were unable to secure prompt shipments from the mills. Manufacturers of all kinds of Hardware are behind in shipments as much as ever, showing that the demand for their products is very great from all localities. Heavy Hardware jobbers report their trade of the most satisfactory character. Iron and Steel and Wagon and Carriage stock are all moving very freely, the consumption being in this immediate vicinity as well as throughout the country tributary to Chicago.

Advices from St. Louis—The Hardware jobbing trade continues in the active condition last noted, and the improvement gives promise of continuing for the balance of the year. The only drawback to the situation is the presence of yellow fever in the South, which continues to curtail business from that section quite considerably. The demand from other sections, however, is very heavy, so that the total business foots up a satisfactory volume. Prices are firm and advances are recorded from day to day. The recent advance in Carriage and Machine Bolts and Lag Screws is being well maintained, although the same cannot be said of Barb Wire, which is in some cases shaded. Wire Nails and plain Wire, however, are very firm, and present indications point to higher prices for these commodities. Builders' Hardware is being ordered quite freely, and in the way of Metals Black Sheets and Galvanized Iron are particularly active, and prices are quite firm. The Heavy Hardware trade is active and the demand from wagon manufacturers is heavier than it has been for many months.

NOTES ON PRICES.

Wire Nails.—During the past week there has been a continuance of the active business in Wire Nails. Trade is unquestionably stimulated by the fact that stocks throughout the country have been small and by the improved tone of the market. Most of the mills are fully supplied with orders and are refusing to accept orders for future delivery at present prices. There has been but little change in the tone of the market, though the tendency is toward slightly higher prices. New York quotations are as before, $1.65 for small lots from store.

Advices from Chicago.—Manufacturers report fair inquiries, but not much buying being done at present. It is likely that most of the large distributers of Nails have covered their wants for the next 60 days, and therefore feel complacent at the advances recently made by manufacturers. The factories, on the other hand, are well supplied with work, some of them refusing to quote even for December delivery, so that the trade is probably well balanced and in good condition. Jobbers quote $1.60 to $1.65 for small lots from stock. The movement from jobbers' stocks is quite active.

Advices from St. Louis.—The demand for Wire Nails is not particularly heavy, although it is likely to pick up at any moment. Jobbers ask $1.65, base, for small lots from store.

Cut Nails.—In sympathy with Wire Nails the Cut Nail market has a firm tone, and while business is not heavy there is a perceptible improvement in the demand. Prices have advanced about 10 cents, small lots from store in New York being quoted at $1.53.

Advices from Chicago.—The demand for Cut Nails is very light as compared with the movement of Wire Nails. The volume of business, however, is about the same from week to week. Small lots from stock are selling at $1.45.

Advices from St. Louis.—The market is in excellent condition, and while the demand is not particularly heavy prices are being maintained without any difficulty.

Barb Wire.—There has been little change in the Barb Wire market during the past week. Its tone continues firm, and a good volume of business is reported. Quotations of last week still hold.

Advices from Chicago.—Jobbers are pleased to find a steady demand from their customers, who are evidently of the opinion that it is a good time to lay in a stock of Barb Wire for the future, even if their customers may not need it immediately. They quote small lots from stock at $1.65 for Painted and $1.95 for Galvanized.

Advices from St. Louis.—The Barb Wire market continues in the satisfactory condition last noted.

Smooth Wire.—There is little change in the Smooth Wire market. There is a good demand for Nos. 14 and 15, while the other sizes are quiet. Prices are unchanged.

Glass.—The conditions prevailing a week ago have in no wise changed. The Glass workers seem no nearer a settlement of their difficulties than then, while the manufacturers are making the most of the time and situation to perfect a reorganization of the Window Glass agencies. New York jobbers' prices for American Window Glass are 60 and 10 and 5 per cent. discount. The French Glass Association, under date September 30, issue a new price-list on imported Glass, as herewith given, which is subject to a discount of 85 per cent.:

French Window and Picture Glass.

	Single.				Double.		
	1	2	3	4	1	2	3
Sizes.	$	$	$	$	$	$	$
6 x 8 to 10 x 15..	15.50	14.50	14.00	13.50	21.50	20.50	19.75
11 x 14 to 16 x 24..	18.50	17.75	16.75	16.00	26 00	25.00	23.75
18 x 22 to 20 x 30..	24.25	23.00	21.25	20.00	33.50	31.75	29.75
15 x 36 to 24 x 30..	26.50	24.50	22.00	.....	36.50	33.75	30.50
26 x 28 to 24 x 36..	28.75	26.75	24.00	.....	40.00	37.25	33 75
26 x 34 to 30 x 40..	32.25	30.50	27.00	.....	45.00	42.75	38.00
32 x 38 to 30 x 50..	38 25	36.50	32.75	.....	52.75	50.50	45.50
30 x 52 to 20 x 54..	39.75	37.50	33.75	.....	55.00	51.75	46.75
30 x 56 to 34 x 56..	41.50	39.00	36.00	.....	57.00	54.00	49.75
34 x 58 to 34 x 60..	43.50	42.00	39.00	.....	59.50	57 50	53.50
36 x 60 to 40 x 60..	47.50	44.25	42.00	.....	64.50	60.50	57.50

White Lead.—Dry White Lead has met with merely ordinary sale, but with the market for crude material in unusually good shape prices have been held very steady by producers generally. Lower prices on Oil have acted as a stimulant to competition among grinders of Lead in Oil, however, and while list prices generally have undergone no change, it is an open secret that concessions of one kind or another have been made to secure desirable orders, not only in the West but in territory nearer to this city. Foreign makes sell at fancy prices, but in retail way only.

Red Lead.—Red Lead has met with merely fair sale, chiefly at old prices, and the market is not perceptibly affected by reported advices of higher quotations from the foreign market.

Linseed Oil.—Cheaper seed and sharper competition between New York City and out of town crushers have served to bring about some demoralization in values, and the market at this writing is decidedly weak.

Spirits Turpentine.—Prices have continued to move steadily upward and are strong at 35 cents for retail lots. The advance was due mostly to higher quotations at the South, but had some support in fairly good purchases here.

Old Rubber.—A moderate business is noted in this department. Local dealers are paying about the following rates:

Car Springs, ton lots, per lb .....3½c.
Rubber Shoes, carloads, delivered at factory, per lb.....4.17c.
Rubber Shoes, less than carloads, per lb.....4c.
White Wringer Rolls, per lb.....4c.
White Syringes, per lb..... .4c.

Old Rags, Paper, &c.—The market for these materials shows considerable strength and activity. Prices are very firm for most lines of Paper Stock. The following are about the rates paid by New York City dealers:

No. 1 White Rags	per lb.	2¾ to 3 c.
No. 2 White Rags	per lb.	1¾ to 2¼c.
Mixed Rags	per lb.	¾c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1½c.
No. 2 White Book Shavings	per lb.	¾ to 1 c.
Light Book Shavings	per lb.	½ to ¾c.
No. 1 Mixed Shavings	per lb.	¾ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1⅛c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to 3/5c.
No. 1 Manila Paper	per lb.	¾ to 9/10c.
No. 2 Manila Paper	per lb.	½ to ⅝c.
Bogus Paper	per lb.	½c.
Common Paper	per lb.	¼ to 3/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1¼ to 1½c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	½ to ¾c.
Hemp Twine	per lb.	1⅝ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	¾ to ⅞c.

Non-Rustable Soldering Fluid.

The following is recommended by J. W. Innes in the *Indian Textile Journal* as a good soldering fluid, free from rusting properties: Take 4 pounds of muriatic acid (spirit of salts), pour it into a vessel that will stand a good heat—one made of fire proof earthenware is a suitable one. Now add about 4 pounds of ordinary zinc cuttings; if old zinc is used a rather larger quantity will be required. It is best to add the zinc in two or three lots. The acid will dissolve the zinc. When it refuses to dissolve any more zinc, it is then known as being thoroughly killed. Let the liquid cool; then add a small quantity of red oxide to color. The next proceeding is to filter. This is an easy matter. Simply pour the liquid through ordinary muslin. Having filtered, add 1 pound of strong liquid ammonia, stir, and then bottle. This preparation can be used as a soldering fluid, and, it is claimed, will not cause rust to appear on the articles on which it is used. The vessel in which the fluid is prepared must be large enough to hold quite 8 pounds, so that when the effervescence takes place the acid cannot overflow.

A very convenient arrangement, which has been introduced lately in a number of railway stations in Germany, might be adopted with advantage in this country. Passengers for suburban stations, instead of going to the regular ticket office and standing in line for several minutes, sometimes so long that they miss their train, can go to an automatic box and by dropping a nickel in the slot or a coin equivalent to the amount of the fare can supply themselves with a ticket in an instant. There are rows of these boxes erected against the wall in convenient locations. The name of the town is painted in large letters, and underneath the price of the ticket. Platform tickets, for the convenience of those who wish to accompany their friends to the train, are issued in the same way.

The returns of the foreign trade of Italy for the first half of the current year show that the imports remained nearly stationary, being $115,935,000, against $115,065,000 in the first half of 1896, while the exports declined in the same period from $110,822,000 to $98,968,500.

The Japan *Mail* states that the Japanese Railroad Company of Tokio, who operate the largest railway line in the Japanese Empire, have decided to expend about $13,000,000 during the next six years in extending their lines and increasing the equipment. The improvements include the double tracking of an important line 140 miles long. The company's rolling stock will, it is said, be increased to 500 locomotives and 1600 passenger and 5200 freight cars.

Progress is being made with the preparations for the Pan-American Exposition, to be held on the Niagara frontier, near the Falls, in 1899. A picturesque and desirable site for the exhibition has been secured at La Salle, on the frontier, where a tract of about 300 acres, accessible by rail, trolley and steamer from Buffalo and Niagara Falls, is being prepared. Plans for the grounds and buildings are now in course of completion, and it is stated by the management that the whole enterprise will be carried out on a liberal and extensive basis, fittingly marking the close of a century of remarkable progress in the Western Hemisphere.

The books of the Merchants' Association of New York show that over 1800 merchants have visited the city within the past six weeks as a result of the special inducements offered by the railroads in the shape of buyers' excursions.

The United States Consul at Ghent, Belgium, reports to the State Department that the Belgian Government has exempted from building, paving and sewerage taxes all houses erected by workmen for their own use or by building associations for the occupation of workmen.

The Japanese Government is reported to have placed orders for one large and eight small torpedo boats with the Schichau Company of Elbing, Germany. The large boat is to have a speed of 28 knots and the smaller ones 25 knots.

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Metal and Miscellaneous Prices

CHICAGO, SEPTEMBER 30, 1897.

Tin—

Straits pigs.....15¼@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
C, 14 x 28		$7.25
X, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
X, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
X, 14 x 56	21.00	$12.50
XX, 14 x 56	24.00	14.00
X, 14 x 60	23.00	13.50
XX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 20½	7.75
	IC, 20 x 20½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
S T P / L Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.90¢	2.50¢
17 to 20	2 00¢	2.60¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ₱ lb, A	$10.20	10% dis.
Patent Planished, ₱ lb, B	9.20	
Craig's Polished Sheet Steel		8½¢

Galvanized.

First quality.....dis. 80@80&2½%

Copper—*Ingot.*

Lake.....12¼@ 12½¢
Casting Brands.....11¾@ 12 ¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₱ lb additional.

Brazed Brass Tubing. (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ luch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-10 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiplug.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4½¢
Bar.....5¼¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin.... ₱ square,	$4.75	$4.50
Galv..... ₱ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....₱ lb 2 ¢
" " Brown.....₱ lb 1½¢
" " Purple.....₱ lb 2½¢
" " Ground in oil, B. Red, ₱ lb 6½¢
" " Ground in oil, Red...₱ lb 0½¢
" " Ground in oil, Brown, ₱ lb 5½¢
" " Ground in oil, Purple, ₱ lb 6½¢
Linseed Oil, Boiled, in bbls.....35¢
Linseed Oil, Raw, in bbls.....3 ¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... 12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs 3 to 6 ¢
Sipe's Japan Oil, in bbls., ₱ gal..... .34¢
Spirits Turpentine, in bbls., ₱ gal..31½¢
Asphaltum, Trinidad Refined, ₱ ton.$45
Tarred Felt, 1 Ply, ₱ 100 lb.....$1.25
Tarred Felt, 2 Ply, ₱ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ₱ roll 108 sq. feet.....$1.25
Roofing Pitch, ₱ bbl. of 300 lb.....$3.00

NEW YORK, OCTOBER 1.

The following quotations are for small lots:

Aluminum—
No. 1 Aluminum (guaranteed over 99% Pure), in rolling ingots.
Small lots.....℔ lb, 42¢
100-lb lots.....℔ lb, 39¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....℔ lb, 34¢
100-lb lots.....℔ lb, 33¢
Special casting Alloy, containing over 30% pure Aluminum:
Small lots.....℔ lb, 35¢
100-lb lots.....℔ lb, 30¢
Aluminum Rods, from ¼-in. diam. to 1 in. diam.....℔ lb, 58¢
Aluminum Sheet, B. & S. gauge.
In lots of 100 lbs or more.

Wider than... And including...	6-in. 24-in. ℔ lb.	25-in. 30-in. ℔ lb.
⅝-in. and heavier	$0.46	$0.46
Nos. 00 to 12	.47	.47
No. 13	.48	.48
" 14	.48	.48
" 15	.49	.49
" 16	.49	.49
" 17	.50	.50
" 18	.51	.51
" 19	.51	.52
" 20	.52	.53
" 21	.53	.54
" 22	.54	.56
" 23	.55	.58
" 24	.57	.60
" 25	.59	.62
" 26	.61	.65
" 27	.63	.68
" 28	.66	.73
" 29	.69	.77
" 30	.73	.81

Note.—Lots of less than 100 lbs 5¢ ℔ lb extra.
Aluminum Wire, B. & S. gauge.
Larger than No. 1.....℔ lb 55¢
No. 1 to No. 8.....℔ lb 60¢
No. 9 to No. 16.....℔ lb 65¢
No. 17 to No. 20.....℔ lb 80¢
No 21 to ——.....℔ lb $1.15

Antimony—
Cookson.....℔ lb, 8¼@8½¢
Hallett's.....℔ lb, 7¾@8¢
Japanese.....℔ lb, 7½¢

Brass—Planished..... net
Roll and Sheet .....35% off

Brass and Copper Tubes
Brazed Brass Tubing—
Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger.	Special
2-in. to 3-in., to No. 19, inclusive	.38

35% off.

Copper & Bronze Tubing—
3¢ ℔ lb more than Brass.

Conductors—
Corrugated. *Round or Square.*—
Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.
Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats ℔ lb 18½@19¢ basis *Ingot.*
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ℔ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—
List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—
Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—
Tin.....70&10%
Galvanized.....80%

Crimped Tubing.
Retinned or Galvanized.....35%

Stove Pipe—
Buffalo Four-Piece

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—
Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*
Galvanized.....70&5%

Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ lb, 2.00	2.30¢
Nos. 17 to 21	℔ lb, 2.10	2.40¢
Nos. 22 to 24	℔ lb, 2.20	2.50¢
Nos. 25 and 26	℔ lb, 2.30	2.60¢
No. 27	℔ lb, 2.40	2.70¢
No. 28	℔ lb, 2.50	2.80¢

American B. B.....℔ lb, 4¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....℔ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ℔ lb. A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....℔ lb, 8½¢

Galvanized.

Nos. 10 to 16	℔ lb,	12¢
Nos. 17 to 21	℔ lb,	13¢
Nos. 22 to 24	℔ lb,	14¢
Nos. 25 to 26	℔ lb,	15¢
No. 27	℔ lb,	16¢
No. 28	℔ lb,	17¢
No. 29	℔ lb,	19¢
No. 30	℔ lb,	21¢

75&10% 5% off.
36 in. 1¢ ℔ lb higher

Kerosene—See *Petroleum Products*

Lead—
American Pig.....4⅝@4¾¢
Bar.....5¼¢
Pipe.....6¼¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....7¼¢. 20%
Old Lead in exchange, 3¼¢ ℔ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—
Per lb.....87¢

Paints, Oils, &c.—
Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1½¢
Red Venetian, American..... @1¾¢
"Donkey" Roofing Paint:
1 quart cans.....50¢
1 gallon cans.....$1.15
10 gallon cans..... 9.00
Linseed Oil:
Raw, ℔ gal..... @38¢
Boiled..... @40¢
Spirits Turpentine:
In bbls.....35¢
In cases.....43¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.
Fancy Lagos.....℔ lb 5 ¢
Clarified.....℔ lb 4⅞¢
Accra.....℔ lb 4¾¢
Half Jack.....℔ lb 4½¢
Cecilia.....℔ 100 lb $4.85
Choice Red.....℔ 100 lb 4.60
(*Spot Oil, ½c. ℔ lb higher.*)

Petroleum Products—
In Barrels (Barrel Included).
Stove Gasoline..... ℔ gal. 10@11¢
Kerosene.....℔ gal. 8¢

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—
"Standard" Pipe, 2 to 6 inches.....70%
Fittings, Pipe, " " ..70&10%
Extra Heavy Pipe, " " ..70&10%
Fittings, Heavy Pipe, " " ..70&10%
Large sizes of both kinds.....60%
Fittings for both kinds.....60%

Pipe, Spiral—
Galvanized.....60%
Tin.....60%

Registers—
1897 List:
Japanned.....50% | Solid Bronze..25%
Nickel Plated40&10% | Porcel'n Enam40%
Imitation Bronze.....40&10%
1896 List:
Japanned.....80% | Bronze Plate..75%
Nickel Plated75&10% | Solid Bronze..40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	℔ lb	℔ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—
Asphaltum, Trinidad Refined, ℔ ton.....$80.00@$35.00
Asphaltum, Rock, ℔ ton.....$14.00
Coal Tar Felt, 1 ply, ℔ lb.....2¢
2 Ply Roofing, ℔ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ℔ roll, 108 sq. ft..... 1.35
Roofing Pitch, ℔ bbl.....$2.40@$2.50

Rosin—
Common and Good—Strained.
Rosin, C. & D.....℔ bbl. $1.82@$1.83
Rosin, E. & F.....℔ bbl. 1.84@ 1.87
Rosin, G. & H.....℔ bbl. 1.90@ 1.95
Rosin, I. & K.....℔ bbl. 2.00@ 2.05
Rosin, M. & N.....℔ bbl. 2.10@ 2.25

Seamless Brass Tubes—
Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—
According to size, f. o. b. cars, Quarry Station.
Pennsylvania:
Best Bangor, ℔ sqr.....$3.75@$5.00
No. 1 Bangor Ribbon..... 3.35@ 3.75
Pen Argyle, ℔ sqr..... 3.75@ 4.35
Peach Bottom, ℔ sqr..... 4.75@ 5.60
No. 1 Chapman, ℔ sqr.... 3.80@ 4.80
Lehigh Slates, ℔ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ℔ sqr.....$2.50@$3.55
Purple, ℔ sqr..... 3.25@ 4.00
Unfading Green, ℔ sqr... 3.75@ 4.50
Red, ℔ sqr..... 9.00@11.00

Solder and Soldering Fluids— Solder—
⅛&½ guaranteed..... 10¾@11¢
No. 1..... 9¾@10½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—
Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels, ℔ lb.....4¢
Smaller quantities, ℔ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ℔ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Kester's Concentrated Soldering Salts.
Per lb.....50¢
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ℔ lb.....3½¢
½ bbls., about 300 lb, ℔ lb.....4¢
Kegs, about 110 lb, ℔ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ℔ lb.....4¢
5% dis.
Walpole Soldering Salts.
f. o. b. Walpole, Mass.
½ lb bottles.....℔ doz., $1.50
1 lb bottles.....℔ doz., 3.00
In Jars, ℔ lb..... 10¢
Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ℔ lb.....40¢

Soldering Coppers—
Per lb.....15½¢@17½¢ net

Spelter—
Western Spelter.....4¾@4⅞¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—
Galvanized.....60%

Tin Pigs and Bars—
Banca, Pigs, ℔ lb.....15¼¢
Straits, pigs, ℔ lb..... 14¾¢
Straits, in bars, ℔ lb.....15½¢

Tin Plates, American—
Charcoal Plates, Bright—
N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Caliand or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.55
" "	IX,	10 x 14 / 14 x 20	5.55
" "	IXX,	14 x 20	6.55
" "	IXXX,	14 x 20	7.55
" "	IXXXX,	14 x 20	8.55
" "	DC,	12½ x 17	4.30
" "	DX,	12½ x 17	5.30
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.15
" "	IX,	10 x 14 / 14 x 20	4.90
" "	IXX,	14 x 20	5.65
" "	IXXX,	14 x 20	6.40
" "	IXXXX,	14 x 20	7.15

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 lb.....10¢
95 lb.....15¢
90 lb.....20¢
85 lb.....25¢

Terne Plates—
N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating		$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating		10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating		8.00 @ 9.25
STP L Grade, 10 to 12 lb coating		6.75 @ 7.50

Tin Plates, Imported—
Duty, 1½¢ ℔ lb.

Charcoal Plates, Bright—

Melyn and Caliand Grade,	IC,	10 x 14	$5 00
" "	IC,	12 x 12	5.25
" "	IC,	14 x 20	5.00
" "	IC,	20 x 28	10.00
" "	IX,	10 x 14	6.00
" "	IX,	12 x 12	6.25
" "	IX,	14 x 20	6.00
" "	IX,	20 x 28	12.00
" "	DC,	12½ x 17	4.75
" "	DX,	12½ x 17	5.75
Allaway Grade,	IC,	10 x 14	4.25
" "	IC,	12 x 12	4.50
" "	IC,	14 x 20	4.25
" "	IC,	20 x 28	8.50
" "	IX,	10 x 14	5.00
" "	IX,	12 x 12	5.20
" "	IX,	14 x 20	5.00
" "	IX,	20 x 28	10.00
" "	DC,	12½ x 17	4.05
" "	DX,	12½ x 17	4.75

Coke Plates, Bright—

Steel Coke, IC,	14 x 20	$4.00
	20 x 28	8.00
	IX, 10 x 14, 14 x 20	4.85
B. V. Grade, IC,	14 x 20	4.00

Terne Plates—

MF, IC,	14 x 20	$6.87½
	20 x 28	12.60
Pontymister Old Style Grade, IC,	20 x 28	11.75
Worcester Grade, IC,	14 x 20	4.25
	20 x 28	8.50
Dean Grade, IC,	14 x 20	4.00
	20 x 28	8.00
Gilbertson's Old Method, IC,	14 x 20	7.50
	20 x 28	15.00

Imported Boiler Plates—
IXX, 14 x 26..(112 sheets).....$9.50
IXX, 14 x 28..(112 sheets).....10.15
IXX, 14 x 31..(112 sheets).....11.25

Troughs, Eave—See *Eave Trough*

Trucks, Stove—
Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ℔ doz... 18.00

Tubing—
Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—
List Feb. 1, 1895.
1¼ and less, Plain.....57&10&10&10%
1¼ and less, Galv.....50&10&10&10%
1½ and larger, Plain.....67&10&10&10%
1½ and larger, Galv.....55&10&10&10%
Boiler Tubes.....60%
Screw and Socket Joint Casing.....50%
Inserted Joint Casing.....45%

Zinc—
600 lb casks ℔ lb 5¾¢ | Per lb.....6¼¢

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Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Electric Oil Stove Co., Homer, Mich.
Wheeler, Russell & Son, Utica, N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.
Wagner Mfg. Co., Sidney, O.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Souther, E. E. Iron Co., St. Louis, Mo.
Weitzel, J. F., Cincinnati, Ohio.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.

Bake Pans.
Filigrove Bros. & Co., Ironton, O.
Kleckhefer Bros. & Co., Milwaukee, Wis.

Baskets, Metallic.
Metallic Basket Co., Cedar Rapids, Ia.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Bath Tub Seats.
Wetter, H. Mfg. Co., Memphis, Tenn.

Beer Pumps.
L. X. L. Beer Pump Co., Phila., Pa.

Boilers, Copper.
Randolph & Clowes, Waterbury, Conn.

Boilers, Range.
Wolff, L. Mfg. Co., Chicago, Ill.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh Pa.
Marlin & Co., Pittsburgh, Pa.
Obdyke, W. A. & Co., Philadelphia, Pa.
Weitzel, J. F., Cincinnati, Ohio.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O
Ohl. Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, O.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Distillers, Water.
Ruud Mfg. Co, Allegheny, Pa.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.
Miller & Peck Mfg. Co., New Haven, Ct.
Stiles & Fladd Press Co., Watertown, N. Y.

Dust Pans.
Dover Stamping Co., Boston, Mass.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio.

Eave Trough Strainers.
Allen, D. C. & Co., Coldwater, Mich.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Electric Oil Stove Co., Homer, Mich.
Wheeler, Russell & Son, Utica, N. Y.

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D. Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Buckwalter Stove Co., Royersford, Pa.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Fox, F. B., Cleveland, O.
Fox Furnace Co., Cleveland, O.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Heath, Chas. P. & Co., Baltimore, Md.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Mt. Penn Stove Works, Reading, Pa.
Monroe Fdry. & Fce. Co., Monroe, Mich.
Pease, J. F., Fce Co., Syracuse, N. Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Richardson & Boynton Co., 232-234 Water St., N. Y.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N.Y.
Smith & Anthony Co., Boston, Mass.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Turner Heater Co., Bristol, Ct.
Walker & Pratt Mfg. Co., Boston, Mass.
Wheeler, Russel & Son, Utica, N. Y.
Wood & Bishop Co., Bangor, Me.

Furnaces, Plumbers' and Tinners'.
Hull, M. L., Cleveland, O.

Galvanizing.
Gregory, Thos. Galvanizing Works, Brooklyn, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Keut, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
Kleckhefer Bros. & Co., Milwaukee, Wis.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Watrous & Co., Troy, N. Y.

Hardware Specialties.
Morris, Jno. B. Foundry Co., Cincinnati, O.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Empire Heating Co., Easton, Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Johnson & Co., 84 John St., N. Y.
Mitchell Heater Co., Poughkeepsie, N.Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fce Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith & Anthony Co., Boston, Mass.
Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York
Wheeler, Russel & Son, Utica, N. Y.

Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
Kleckhefer Bros. & Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Wagner Mfg. Co., Sidney, O.

Hollow Ware, Aluminum.
Illinois Pure Aluminum Co., Lemont, Ill.

House Furnishing Supplies.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co., Boston, Mass.

Iron, Galvanized Sheet. (*See Sheets, Galvanized.*)

Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Huse, Jos. & Son, Boston, Mass.
Muusell, Eugene & Co., 218 Water St., New York.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co., 47 Dey St., N. Y.
National Pipe Bending Co., New Haven, Conn.
Peck Bros. & Co., New Haven, Conn.
Randolph & Clowes, Waterbury, Conn.
Sprout & McGurrin, Grand Rapids, Mich.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wetter, H. Mfg. Co., Memphis, Tenn.
Wilson, R. M., Rome, N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Pokers and Lifters.
Arcade Mfg. Co., Freeport, Ill.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N.Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
West Mfg. Co., Buffalo, N. Y.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.

Radiator Rests.
Gorman-English Co., Wilkes Barre, Pa.

Radiators, Hot Air.
Castle, Wilmot & Co., Rochester, N. Y.
Rochester Radiator Co., Rochester, N. Y.

Radiators, Steam and Hot Water.
Fowler & Wolfe Mfg. Co., Phila., Pa
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.
Webster City Hot Water Heating Co, Webster City, Ia.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Registers.
Berger Bros., Phila., Pa.
Creamer, W. G. & Co., 96 John St., N Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Ferrosteel Co., Cleveland, Ohio.
Highton, Wm. & Sons, Boston, Mass.
Schreiber & Conchar Mfg. Co., Dubuque, Iowa.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Roofing, Asphalt.
Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Bowers, L. M. & Co, Binghamton, N.Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Ironton Roof. & Cor. Co., Ironton, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J
Phila. Steel Roofing Co., Phila., Pa.
Souther, E. E. Iron Co., St. Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N.Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., East Bangor, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.
New York Trade School, First Ave. and 67th St., N. Y.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N.Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., New Haven, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Universal Machine Co., Canton, Ohio.
Watrous & Co., Troy, N. Y.
West Mfg. Co., Buffalo, N. Y.

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Sheet Metal Work.
Weitzel, J. F., Cincinnati, Ohio.

Sheets, Iron and Steel.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.
Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Slate Work.
Coulman & Westcott, Fair Haven, Ct.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.
Watrous & Co., Troy, N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Soap Shakers.
Woods, Sherwood & Co., Lowell, Mass.

Solder.
Bruce & Cook, 186 to 190 Water St., N. Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Stamped Ware, Aluminum.
Illinois Pure Aluminum Co., Lemont, Ill.

Statuary, Sheet Metal.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.
Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove and Metal Polish.
Adams Mfg. Co., Minneapolis, Minn.

Stove Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Berger Bros., Phila., Pa.
Ironton Roof. & Cor. Co., Ironton, O.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Lock.
Kerr, M. B., Winfield, Kans.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.
Parks & Parks, Troy, N. Y.

Stove Putty.
Connors, Wm., Troy, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Hessler, H. E., Syracuse, N. Y.
Howes, The S. M. Co., Boston, Mass.
Kieffer Bros., Syracuse, N. Y.
Kurtz, E. F., Phila., Pa.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Morris, Jno. B. Fdry. Co., Cincinnati, O.
Morris, J. L., Chicago, Ill.
Troy Nickel Works, Troy, N. Y.
Zeager, J. Elwood, Phila., Pa.

Stove Trimmings, &c.
Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Howes, The S. M. Co., Boston, Mass.
Mersick, C. S. & Co., New Haven, Ct.

Stoves and Ranges.
Beckwith, P. D., Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Buckwalter Stove Co., Royersford, Pa
Bussey & McLeod Stove Co., Troy, N. Y.
Cedar Rapids Stove Co., Cedar Rapids, Iowa.
Champion Steel Range Co., Cleveland, Ohio.
Chicago Stove Works, Chicago, Ill.
Clad, V. & Sons, Phila., Pa.
Co-operative Foundry Co., Rochester, N. Y.
Culter & Proctor Stove Co. Peoria, Ill.
Eclipse Stove Co., Mansfield, O.
Emrich Co., Columbus, O.
Excelsior Stove Mfg. Co., Quincy, Ill.
Ferrosteel Co., Cleveland, Ohio.
Gem City Stove Co., Dayton, O.
Graff & Co., 208 Water St., N. Y.
Howes, The S. M. Co., Boston, Mass.
Magee Furnace Co., Boston, Mass
Michigan Stove Co., Chicago, Ill.
Miller, Wm. Range & Furnace Co., Cincinnati, O.
Mt. Penn Stove Works, Reading, Pa.
No. Dighton Co-op. Stove Co., No. Dighton, Mass.
Rathbone, Sard & Co., Albany, N. Y.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Robinson & Sons, Chicago, Ill.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Anthony Co., Boston, Mass.
Somerset Stove Foundry Co, Somerset Mass.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., New York.
Troy Stamping Works, Troy, N. Y.
Warren Hardware Co., Warren, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Adler, H., Tr. Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, O.
Electric Gas Stove Co, Detroit, Mich.
Reineke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barler, A. C. Mfg. Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Electric Oil Stove Co., Homer, Mich.
Miller, Edward Co., Meriden, Conn.
Monarch Stove Co., Mansfield, O.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., New York.
Hill-Whitney Aluminum Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tea Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co Rome, N. Y.

Tinners' Tools, Machines and Supplies.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tin Plate. (*Mfrs. of.*)
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphi Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Trade Schools.
N. Y. Trade School, First Ave. and 67th St., N. Y.

Traps and Vents.
Sproul & McGurrin, Grand Rapids, Mich.

Tubing, Brass and Copper.
Randolph & Clowes, Waterbury, Conn.

Valves.
Eastwood Wire Mfg. Co., Belleville, N. J.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.
Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Waffle Irons.
Wagner Mfg. Co., Sidney, Ohio.

Washers, Valves, &c.
Marston, I. G. & Co., Boston, Mass.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co., 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.
Rund Mfg. Co., Allegheny, Pa.

Wire Goods.
Woods, Sherwood & Co., Lowell, Mass.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

SEE ALPHABETICAL INDEX, PAGE 87.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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A good all-around country TINSMITH and HARDWARE CLERK, one accustomed to roofing, spouting, guttering and plain piping and pump work; steady work to the right man; must be sober and willing to work; give reference and state wages. Wm. C. Cook, Branchville, N. J. Oct. 2

First-class expereniced STEEL RANGE BUIDLER, one who is competent to take charge as foreman of our steel range department. Address, giving experience, recommendatious and with whom last employed and amount of salary expected to start with. "S. R.," office of *The Metal Worker*, 232-238 William street, New York Citv. Oct. 2

Furnace and range SALESMAN, familiar with trade in New York City and vicinity; state age; give references and experience. "Furnace & Range," office of *The Metal Worker*, 232-238 William street, New York Ctiy. Oct. 2

SALESMEN to sell steel ranges on commission in Michigan, Wisconsin, Iowa, Minnesota, North Dakota and South Dakota; please state territory covered and give reference. "Steel Range," offi e of *The Metal Worker*, 232-238 William street, New York City. Sept. 25

Experienced SUPERINTENDENT to take charge of shop manufacturing plumbers' brass work; must be a practical mechanic; state experience, reference, and salary expected. "X. Y. Z.," office of *The Metal Worker*, 232 238 William street, New York City. Sept 25

CANVASSERS for HEAT REGULATORS for city and suburbs; also trade salesmen; liberal commissions paid Howard Thermostat Company, 231 Water street, New York City. Sept. 25

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A first-class TINNER aud PLUMBER; one who has had s me experience in steam and hot water heating; must be a good all around man and sober. G. & W. Hess, Monroeville, Ohio. Sept. 25

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By a first-class TINNER, also understands general pipe fitting, and is competent to take charge of small business: small town preferred; good references. F. C. Des Rocher, Leesburg, Fla. Oct 2

By a TINSMITH with six years' experience in both country and city shop; able to cut all ordinary patterns for cornice and sheet metal work and to work from plans; soher and reliable; can furnish references; would like steady positon in a good country shop with chance for advancement. John S. Nelson, 247 East 126th street, New York Ctiy. Oct. 2

By a TINSMITH; 15 years' experience; some knowledge of plumbing, steam fitting and bell wiring. "C. E. B.," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 2

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By a reliable, sober man; galvanized iron cornice work, tin, copper and slate roofing; flat and standing seam roofing; city or country; married. "J. J. M.," 3597 South Spring avenue, St. Louis, Mo. Oct. 2

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By a japanner, plain and ornamental, as FOREMAN; understands all branches of the business; can furnish first-class references. M. T. Walker, Floyd Knobs, Floyd County, Ind. Oct. 2

As FOREMAN; 25 years' experience in handling men in the manufacture of galvanized iron cornices and skylights; position in a first-class shop where his services would be appreciated; best of reference furnished if necessary. "Steady," care of D. T. Collins, Esq., 2250 Third avenue, New York City. Oct. 2

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By a PLUMBER; first-class mechanic; thoroughly capable; good steam and hot water fitter; strictly sober and reliable; reference; city or country. "Plumber," care J. A. Flandreau, Pelham road, New Rochelle, N. Y. Sept. 25

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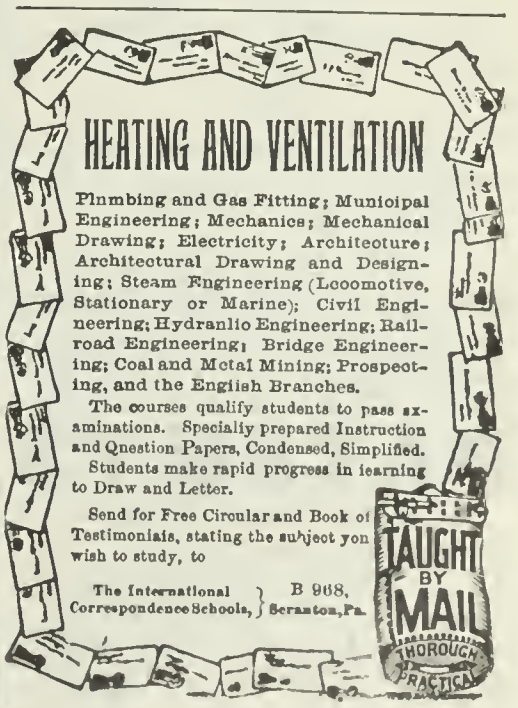
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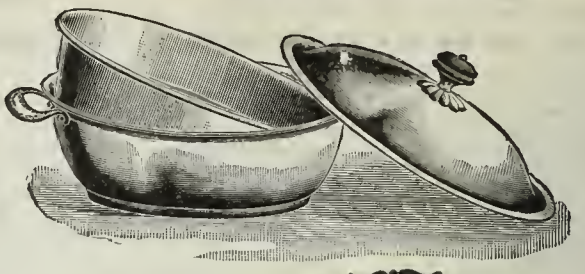

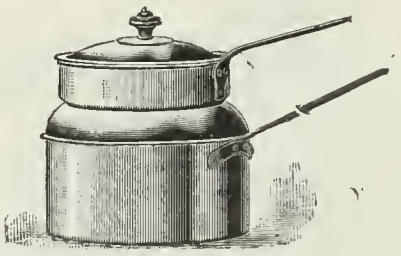

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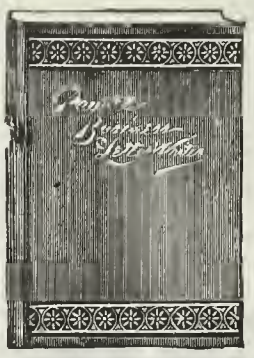

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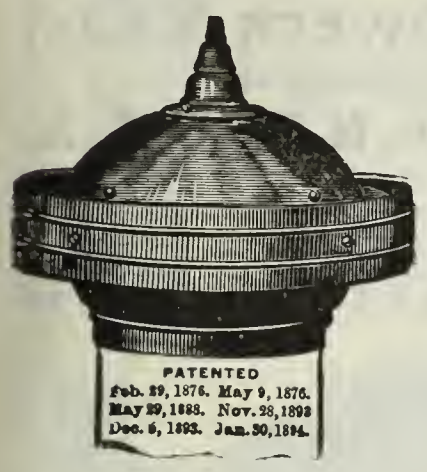

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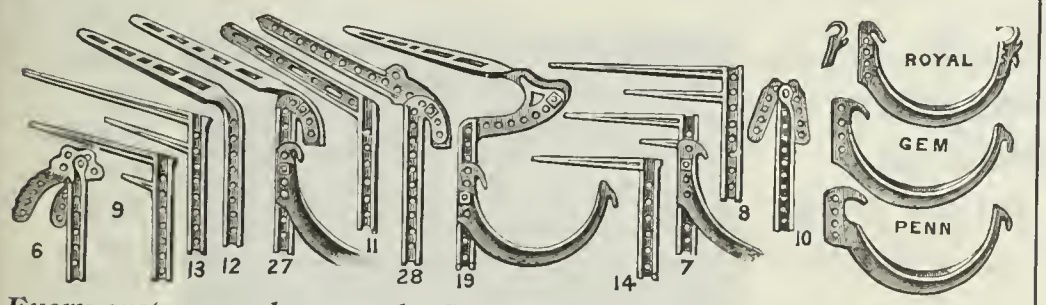

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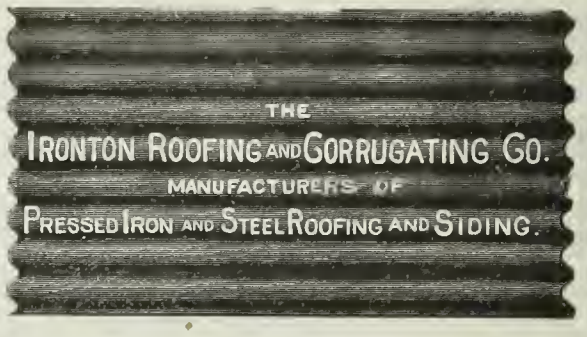

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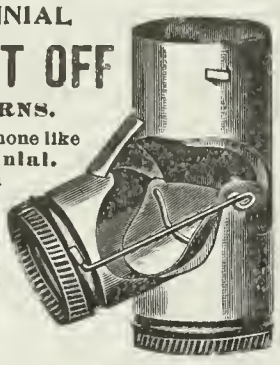

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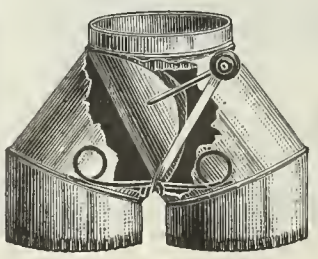

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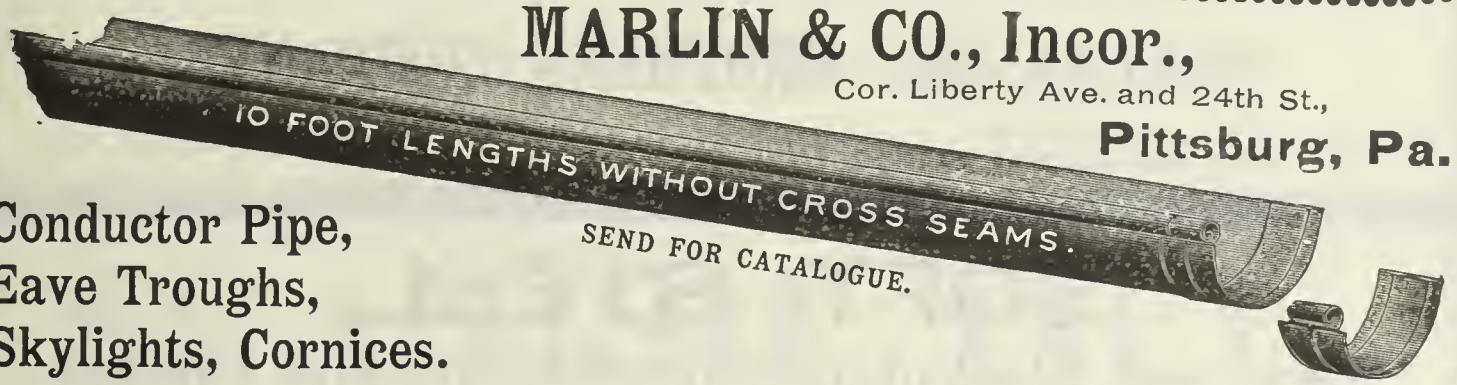

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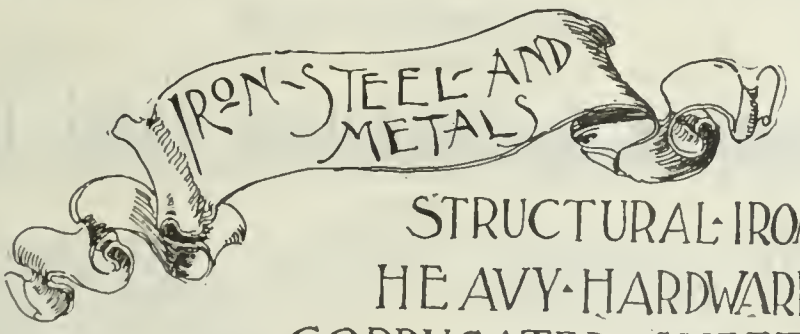

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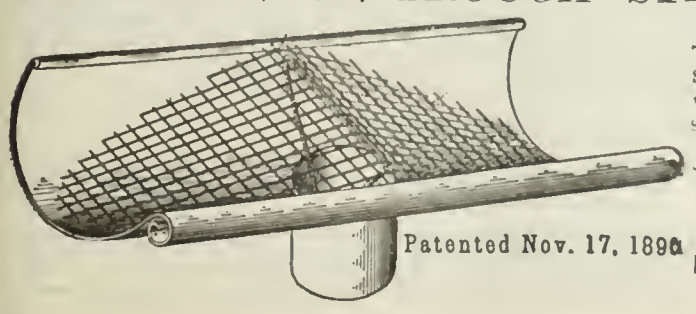

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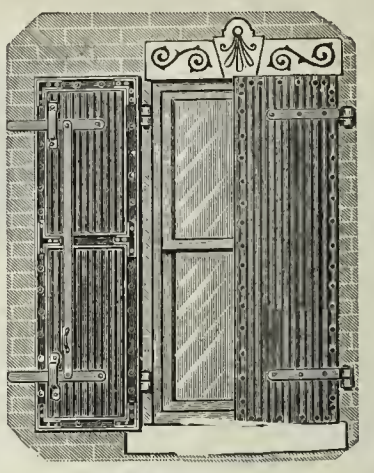

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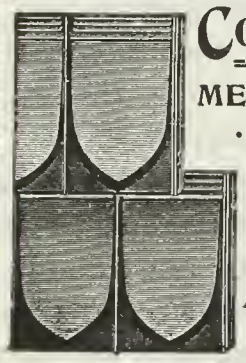

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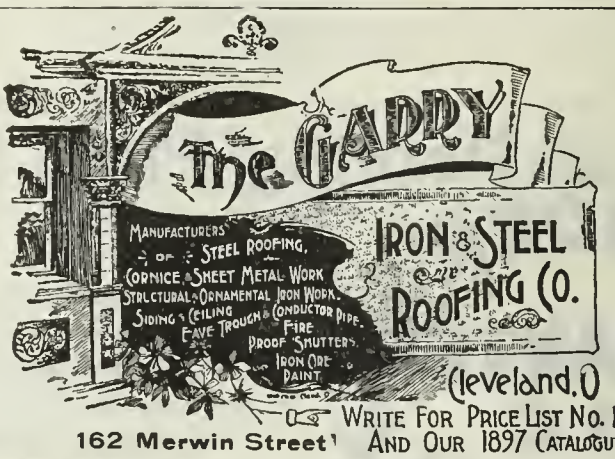
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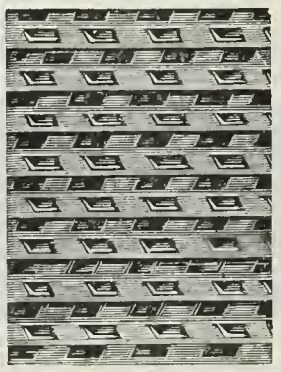

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—A VISITOR in Pass Christian, Miss., the other day heard some pistol-shots, and asked a negro boy what they meant. "Oh," was the reply, "them fellows dun be shootin' fo' hats." "Shooting for hats!" exclaimed the visitor, "what on earth do you mean?" "Sure, dere is nuffin' strange 'bout dat; they's doin' it ebry day, 'most. When de train is comin' day jes' fires dem shots when she gets good on de bridge, an' de men day sticks dere heads out to see what's up, an' de wind jes' takes dere hats off an' drops 'em in de bay. Den dey rows around an picks 'em up. Sometimes dey gets a lot of 'em. Other day Josh Johnson got seben." "What does Josh Johnson do besides shoot for hats?" was asked. "Oh, he fishes an' does odd jobs an' lives."—*N. Y. Tribune.*

—CURIOUS NATIONAL CUSTOM.—"I was so mad," said the vivacious young American lady, "that I could have eaten a pound of nails."

The listening Englishman made a note in his commonplace book that evening: "Anger is so well recognized as a nervous complaint in this country that the natives are in the habit of taking iron to counteract it."—*Cincinnati Enquirer.*

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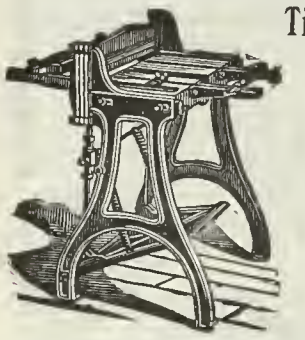

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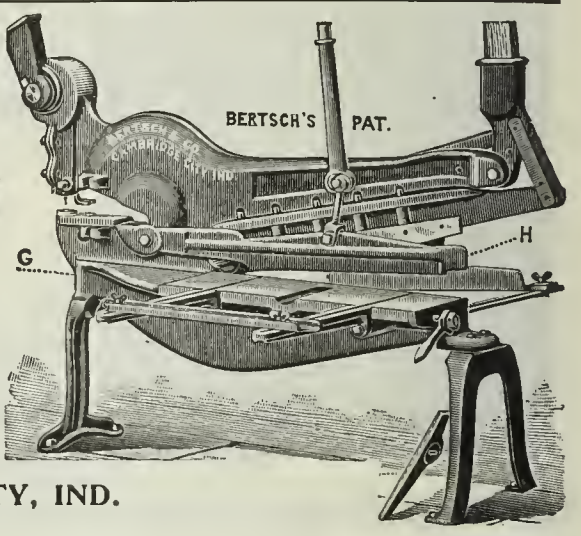

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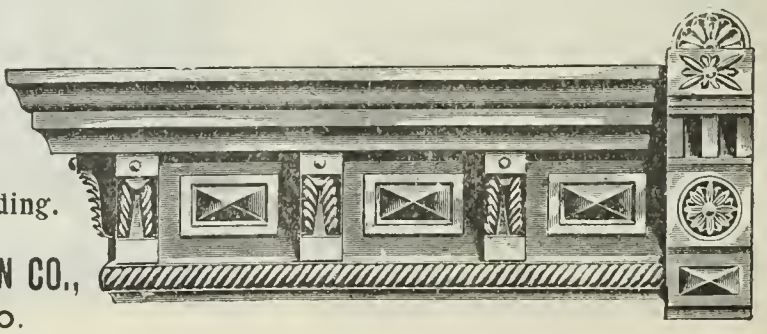

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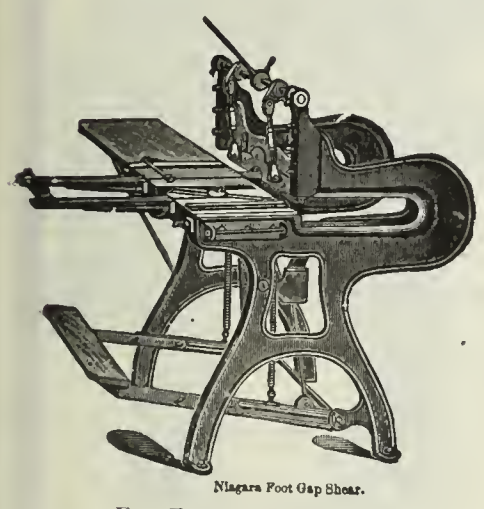

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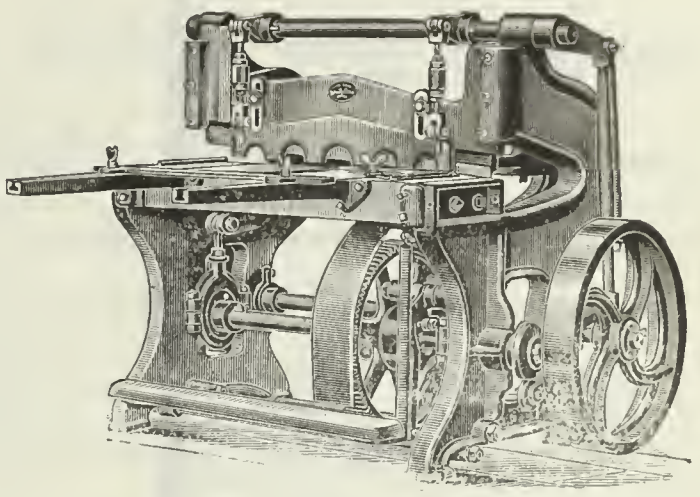

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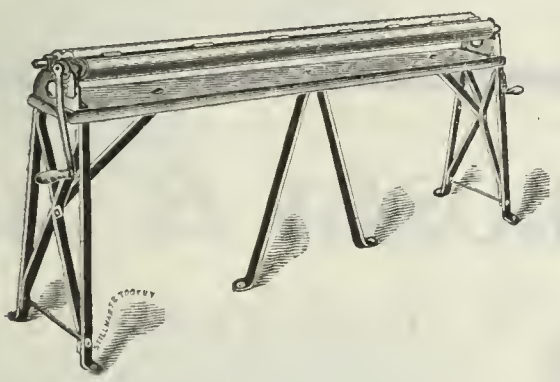

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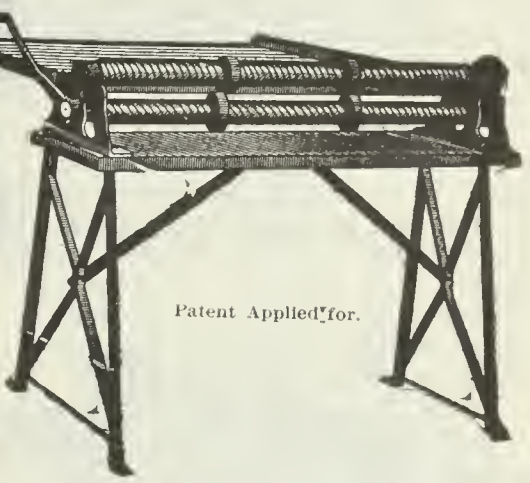

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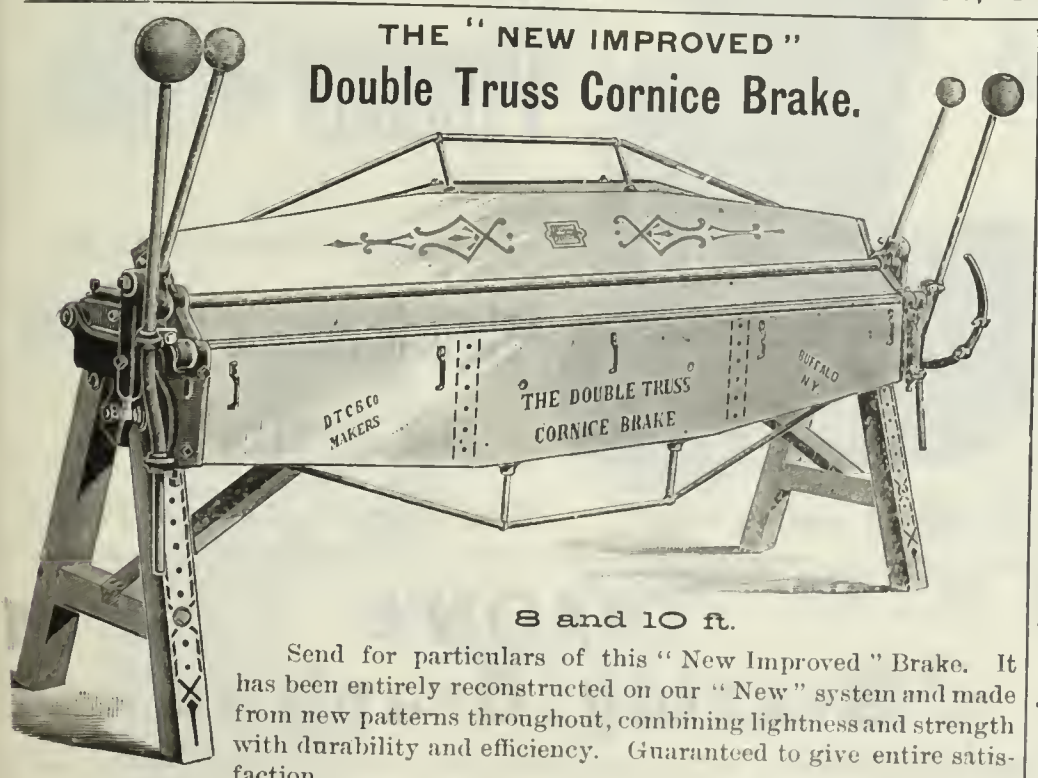

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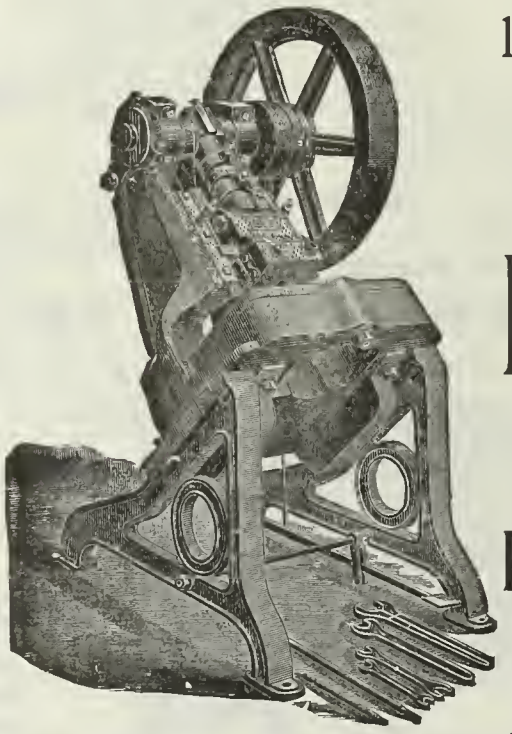

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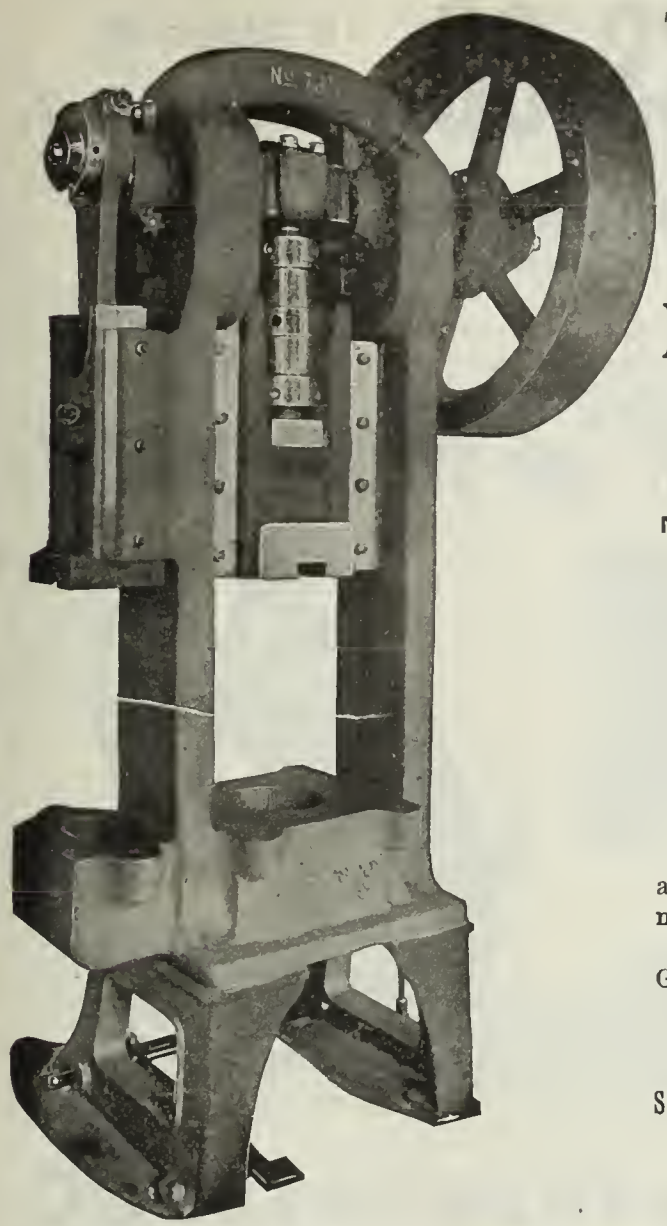

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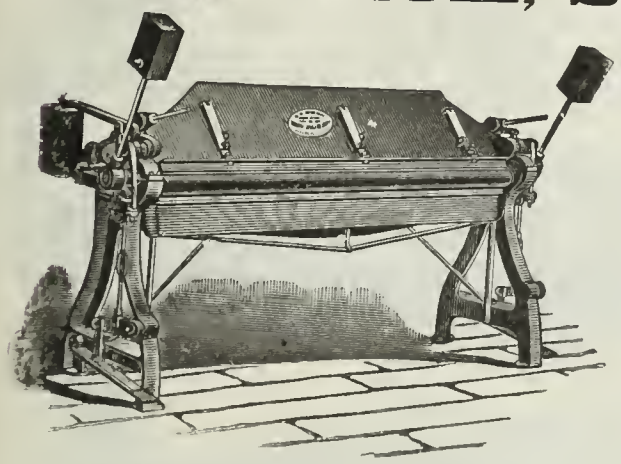

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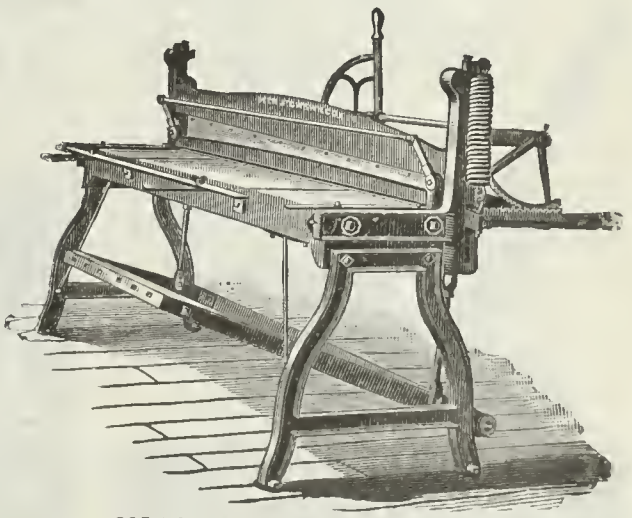

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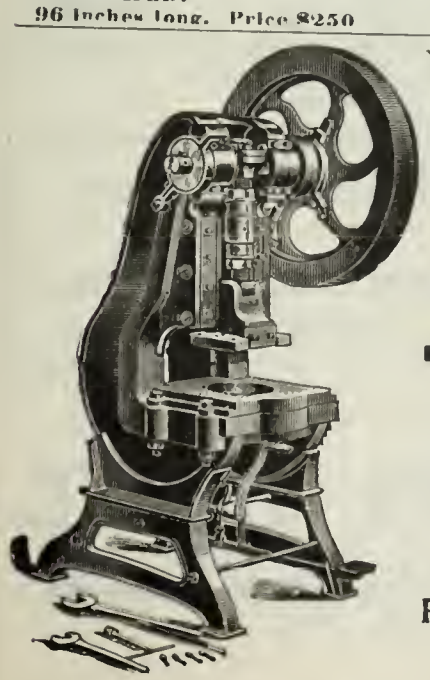

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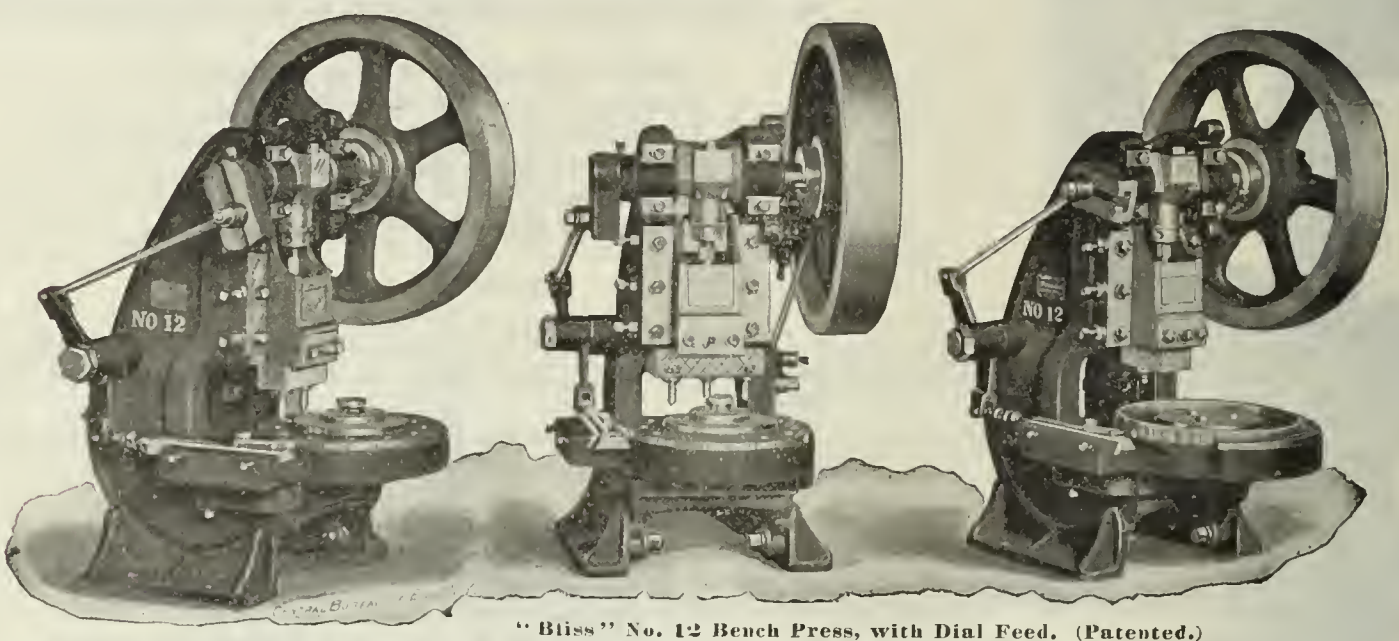

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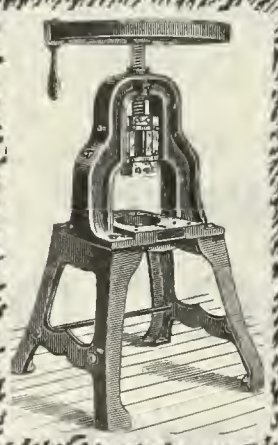

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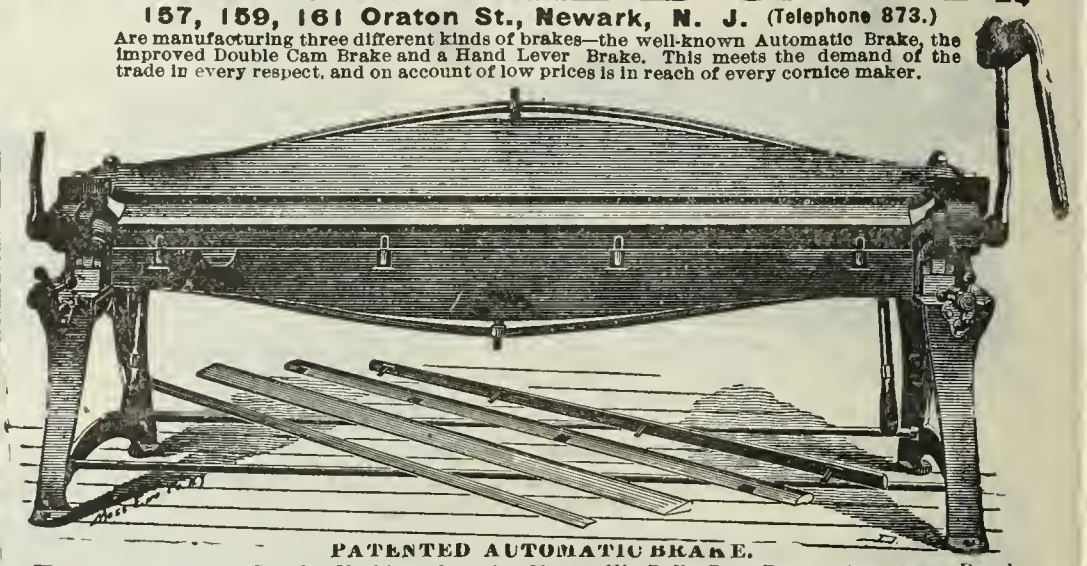

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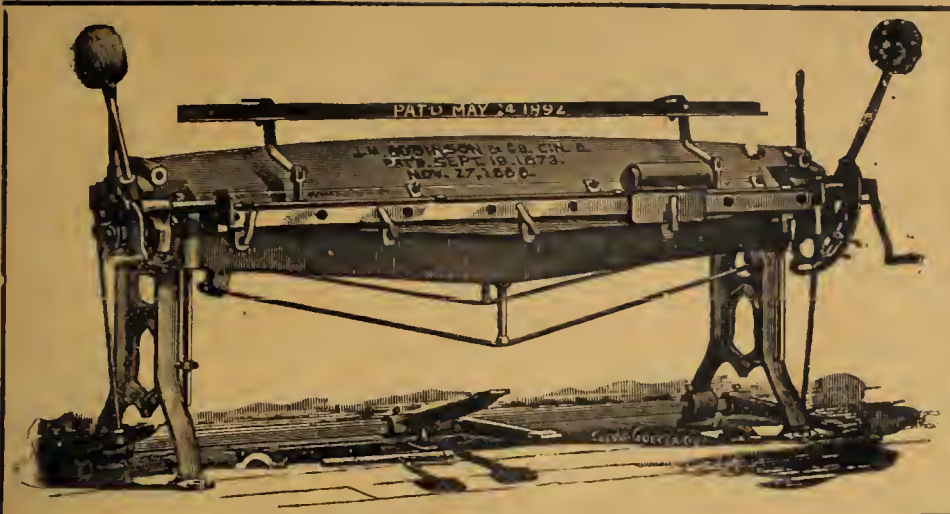

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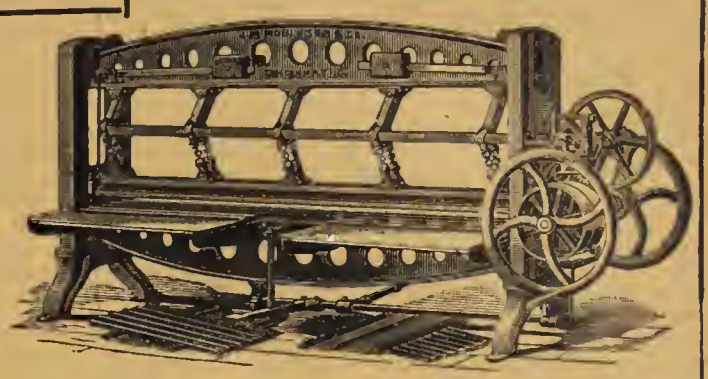

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Manufacturers of Genuine Bangor No. 1 and No. 1 Ribbon Slate, Urinals, Hearths and Slate Mantels. Send for Prices. Also circular of Bray's Galvanized Snow Guard.

...PRESS-WORKING OF METALS...

A Treatise upon the Principles and Practice of Shaping Metals in Dies by the Action of Presses, together with a description of the construction of such implements in their various forms, and of the materials worked in them.

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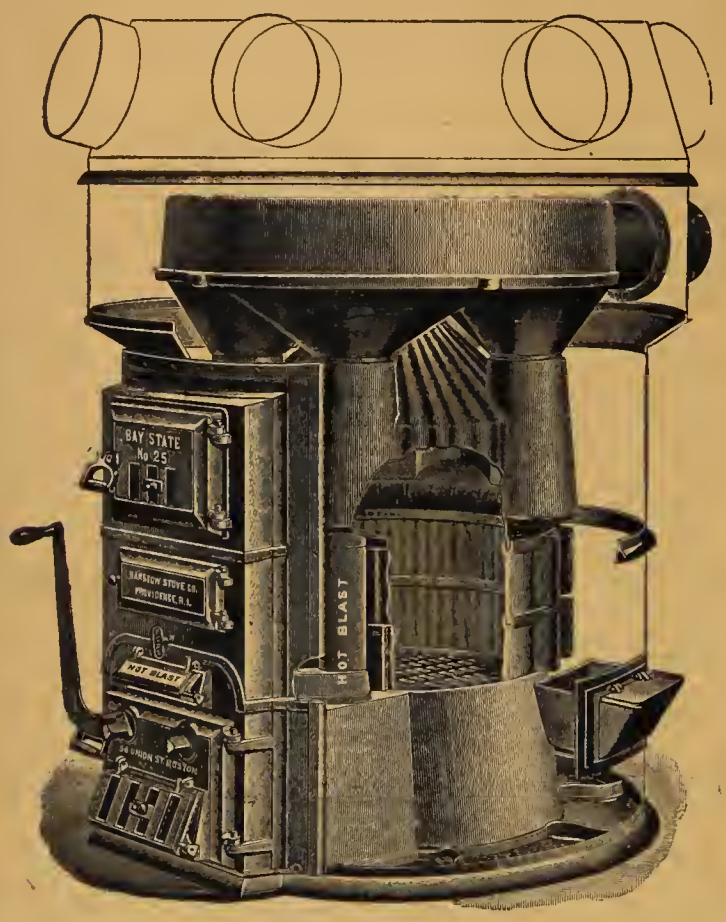

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N. & G. TAYLOR CO.'S
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Roofing Tin
On
THE WHITE HOUSE,
Washington, D C.

The wear is the true test of value.

This brand of Tin was selected by the U. S. Government over all Competitors.

The trade will recall that another brand was used for this roof only a few years ago.

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"CAST IRON PIPE and SPECIALS for WATER and GAS. Also Flanged Pipe and Fittings, Hydrants, Gates, Pig Lead, etc. CHAS. MILLAR & SON, Selling Agents Utica, N. Y. Manufacturers of Lead Pipe and Plumbers' Materials. Wholesale Eastern Agents Akron Vitrified Sewer Pipe.

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have a little more pride in what you sell. If it's stoves—don't confuse the customer with a half-dozen different kinds of half way goods.
Get a thoroughly reliable, up to date Line, like the

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Write the Weir Stove Co., Taunton. Mass.

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American Made. Guaranteed Superior Quality.

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PHILADELPHIA, PITTSBURG, PA.
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Index to Reading Matter, Page 75

Index to Advertisements, Pages 78 - 80

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. XLVIII. NUMBER 15. | NEW YORK AND CHICAGO, OCTOBER 9, 1897. | ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

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MANUFACTURERS OF FLUSH & SUPPLY PIPES. BASIN LAVATORY LEGS AND BRACKETS. AND BATH QUARTER BEND SLIP JOINT SUPPLIES CLOSET CONNECTION.

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WILL BURN HARD OR SOFT COAL.

You Want the Best. We Have It.

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For Slate and Tile Roofs.

Metallic and Graphite Paint,

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PARAGON HOT AIR FURNACES

SIX POINTS ~ 1·FEWEST JOINTS 2·EQUALIZED DRAFT 3·LARGEST RADIATING SURFACE 4·ABSOLUTELY SELF CLEANING 5·BALL BEARING GRATE 6·PERFECT ADAPTABILITY TO ANY KIND OF COAL

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Write for our FURNACE BOOK "HINTS ABOUT HEATING" It will interest you IT MAY HELP YOU

EXCLUSIVE RIGHTS GIVEN TO ENTERPRISING DEALERS

TRADE APOLLO BEST BLOOM MARK

APOLLO GALVANIZED IRON.

Some work almost requires Apollo. Any iron will do for rough work.

Is there any advantage in using inferior iron?

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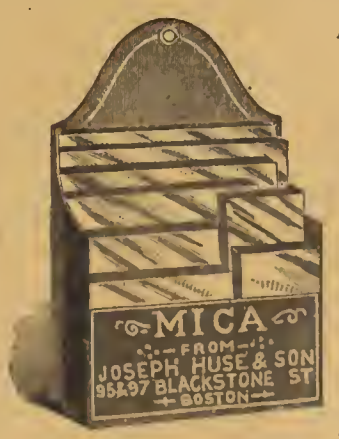

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This valve has no dash pots, springs, guides or complicated levers to get out of order. It is simple, reliable and well made. Never sticks, and can be relied upon at all times when using exhaust steam for heating; or when used as a relief, or free exhaust on a condensing plant, it has no equal. It is noiseless and free from any complicated attachments.

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SEE THE MAGEE advertisement on page 17 showing the Magee Grand Range.

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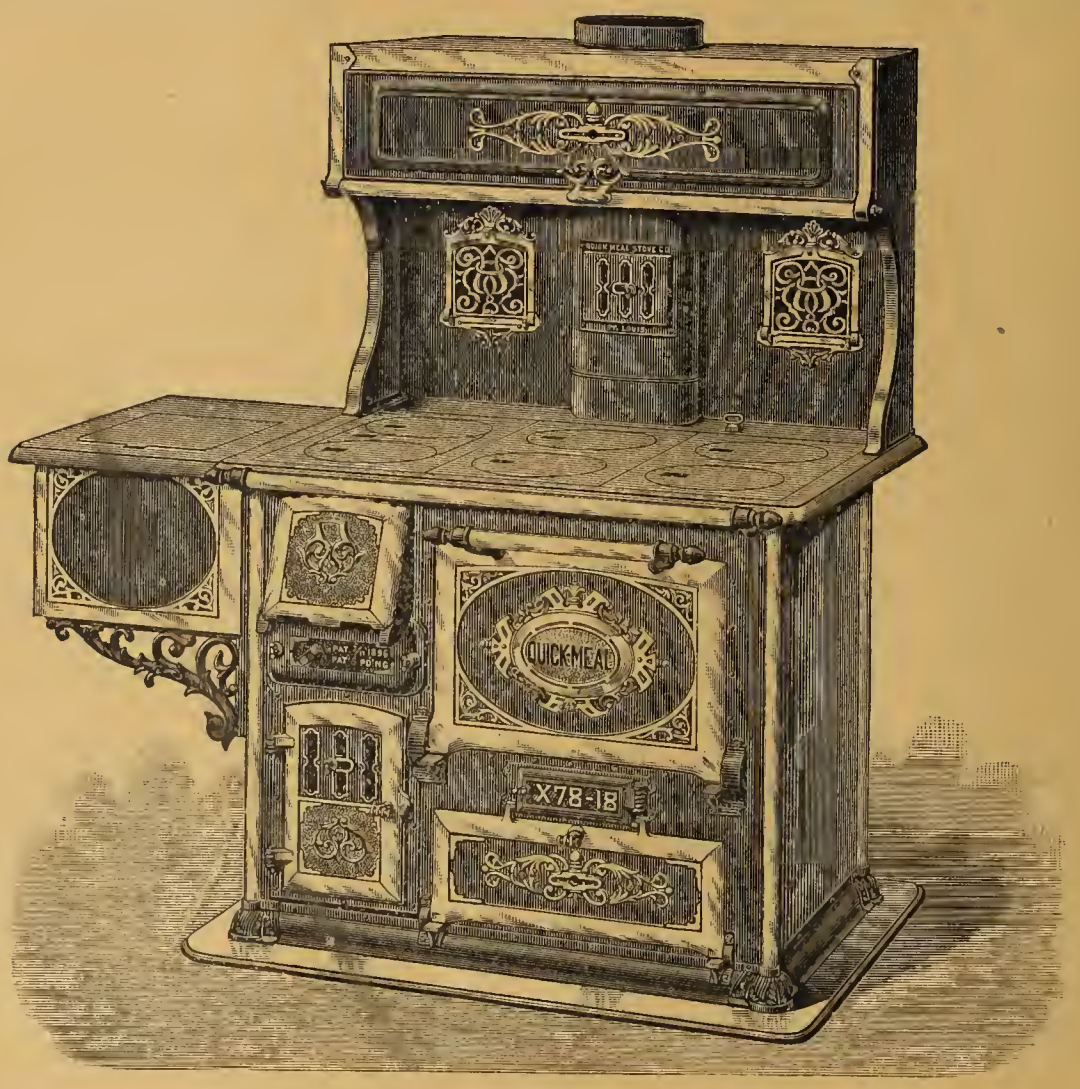
MAGEE FURNACE CO., Boston, Mass.

"QUICK MEAL"

STEEL RANGES

ARE EASY TO SELL



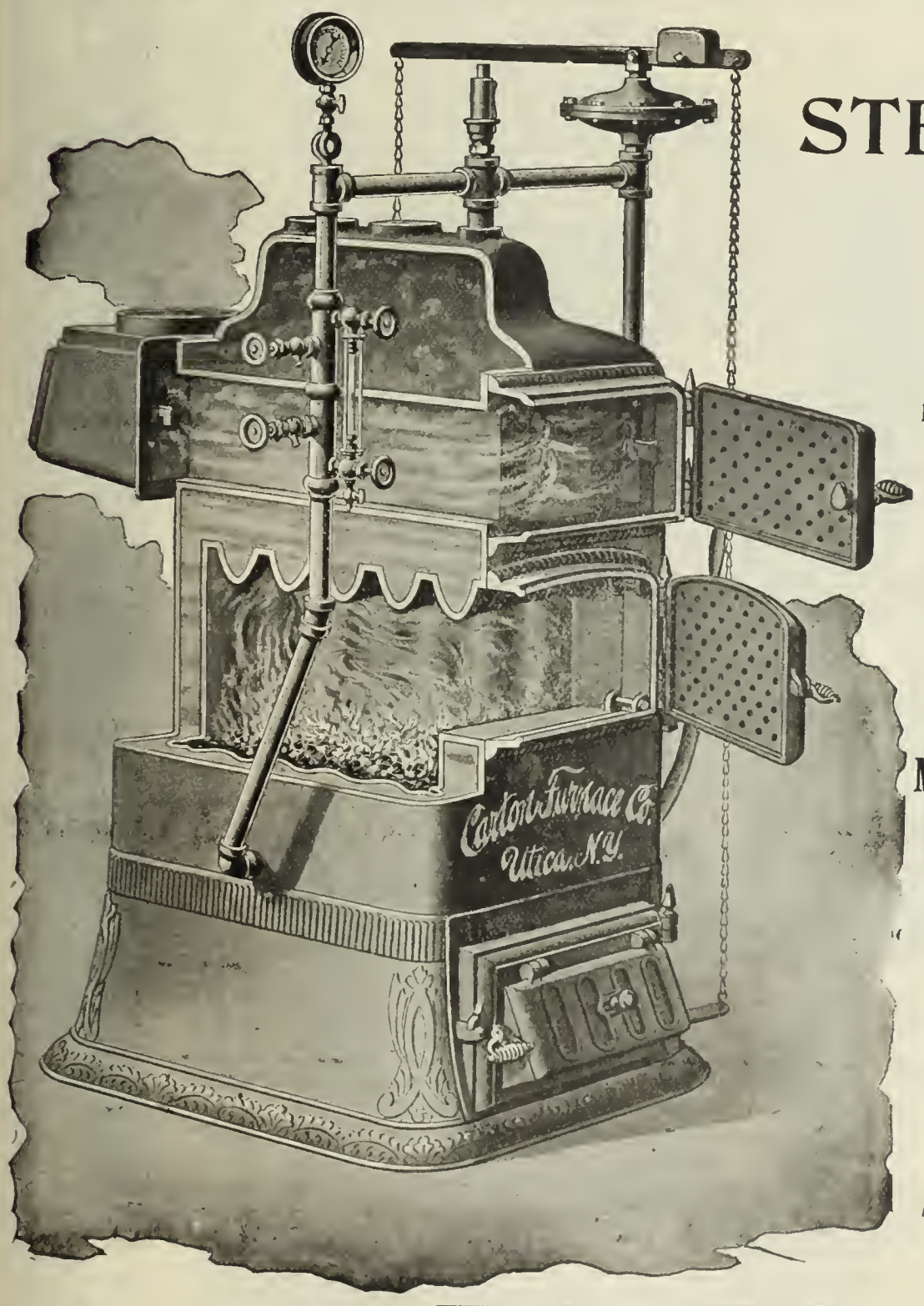
BECAUSE the points of superiority over other Ranges are so many and so marked that customers can be made to see them at once. No brain-racking is necessary to find talking points for "Quick Meals." Then the name is one that is known everywhere and is a recommendation in itself. The prices, too, are such as to help make them easy sellers. No customer can "stump" you on a single point of construction. We have taken care of that. They are also the finest appearing Ranges on the market. The ornamentation is rich and tasteful. There is just enough of it; neither too much nor too little. These facts are proven by the way "Quick Meals" are selling. There are no signs of dullness in the Steel Range department of the "Quick Meal" factory. We are running full and selling all we make. Handle "Quick Meal" Steel Ranges and you will be busy, too.

Ringen Stove Co.

ST. LOUIS, MO.

Carton

Hot Water & Steam Boilers & Furnaces.



FOR

STEAM

AND

WATER.

Notice the

CROWN SHEET

with large

FIRE SURFACE,

a feature of this Heater.

Made in 2 PIECES with

LOCK NUT

Nipple Connections.

All Vertical Circulation.

Send for our GOLDEN JUBILEE Anniversary BOILER CATALOGUE.

1847-1897.

If Interested in Hot Air Furnaces, we make a most complete line and you should send for our New Furnace Catalogue and Prices.

CARTON FURNACE CO.,

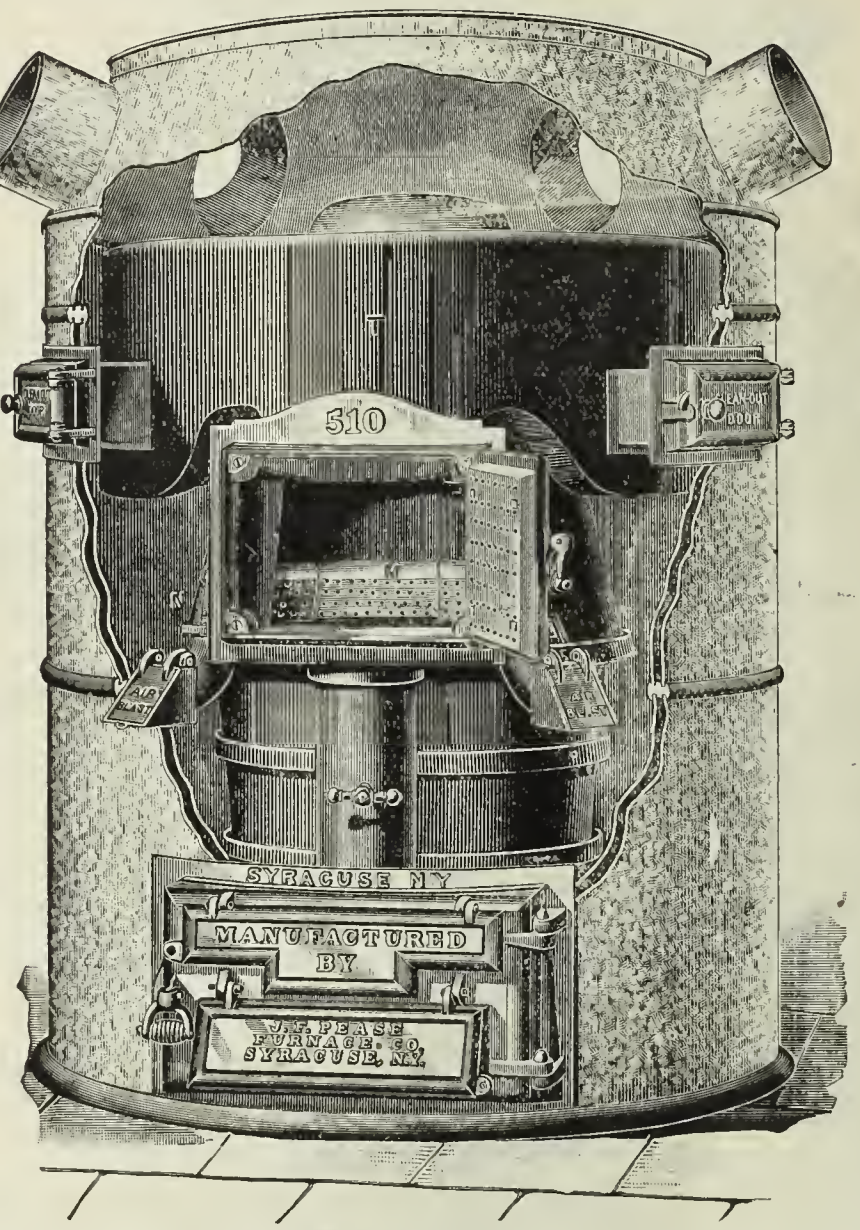
Makers of Heating Apparatus for the past *50 Years*,

UTICA, N. Y.

ECONOMY J. F. PEASE FURNACE CO. ECONOMY

PEASE
Air Blast Furnace

SPECIAL SOFT COAL BURNER.



SPECIFICATIONS—Low in Stature. Not High Priced. Special Adjustable Air Blast Appliance. Nearly Jointless Construction. Selection from 3 Styles of Grate. COUNTER-BALANCE SPRING REGULATOR.

Permit us to send you our 1897 Catalogue.

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MANFRS. OF
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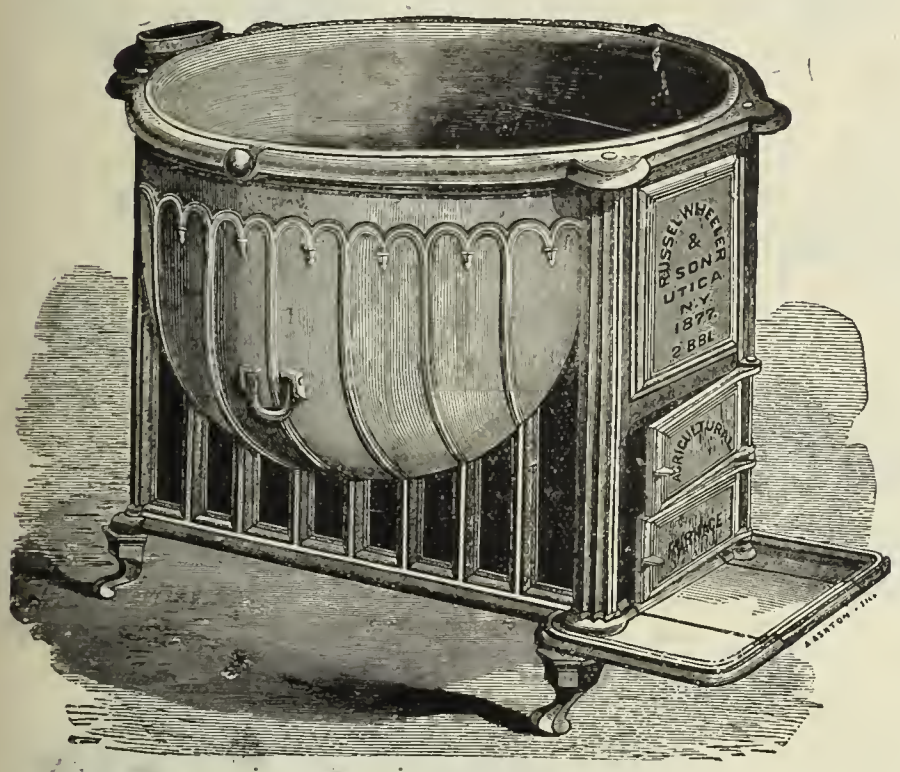
FARMERS' AND BUTCHERS' BOILER.

— FOR —

COAL AND WOOD.



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Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

SIX SIZES.

VERY LONG FIRE BOX,
REVERTIBLE FLUE
AND
ADJUSTABLE DAMPER.

An enterprising farmer can't afford to be without one. Put one on your floor and convince him the next time he comes in.

WRITE FOR CATALOGUE AND PRICE-LIST.

THE FORBES WARM AIR FURNACE.

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Messrs. TUBULAR HEATING AND VENTILATING CO., 228 Quarry Street, Philadelphia.

GENTLEMEN:—The Forbes Warm-air Furnace placed in my house last fall has given me entire satisfaction.

During the greater part of the winter the house had to be kept at a very high temperature, owing to illness in the family. Your furnace did all it was called upon to do, and ou a remarkably small amount of coal.

Last winter a furuace of a popular make failed to even warm the house comfortably, and burned fully 50% more coal.

I think your furnace is all you claim for it, and do not hesitate to recommend it to any one desiring comfort and economy. Very truly,

5027 Florence Avenue. M. J. FALLS.

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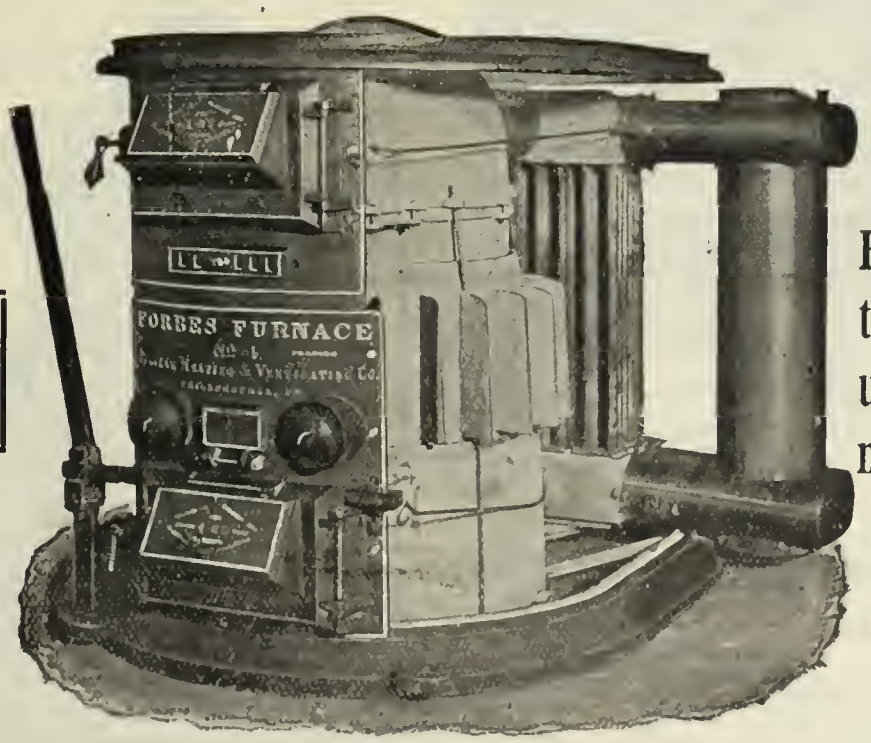

COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

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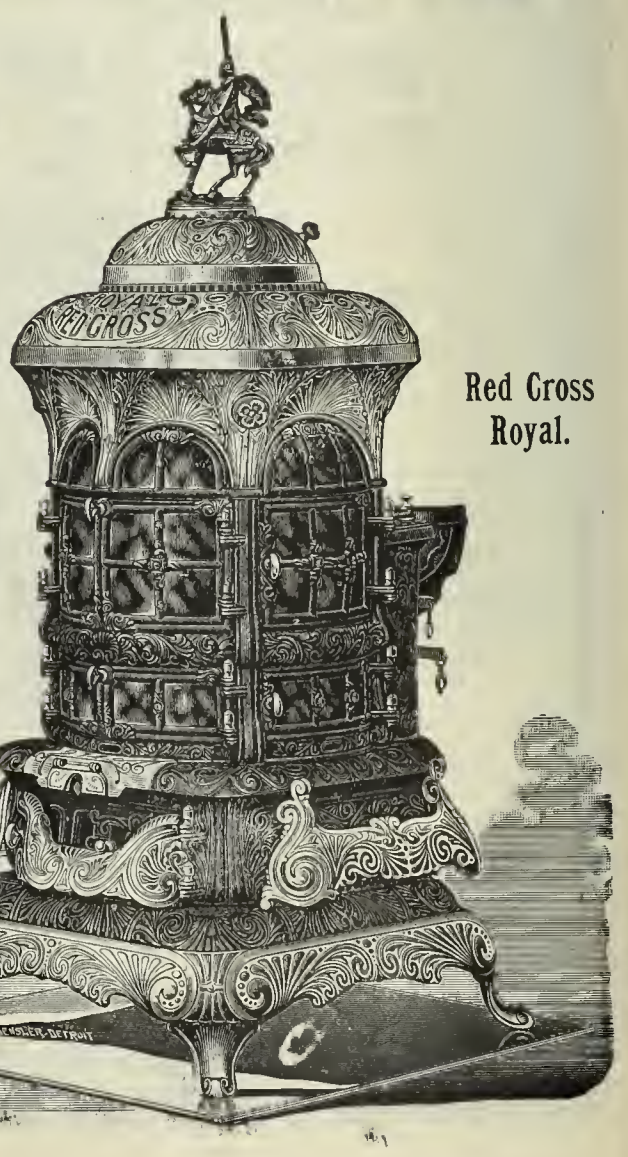
STOVES & RANGES
HOT AIR FURNACES
HOT WATER HEATERS

Popularity is the only true index of merit.

Our Trade-Mark of the Red Cross is the index of popularity.

New Red Cross Oak.



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WESTERN AGENCY FOR

Co-operative Foundry Co.,

ROCHESTER, N. Y.

The most complete Line of Stoves and Ranges in the American Market.

Everything about the Only Round Oak
is genuine:

No idle claims are made:

No promises are unkept:

None are untrue:

The Counterfeit "Oak"

Ninety-nine times

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cannot be sold—only

under the name—Round Oak—

made famous by

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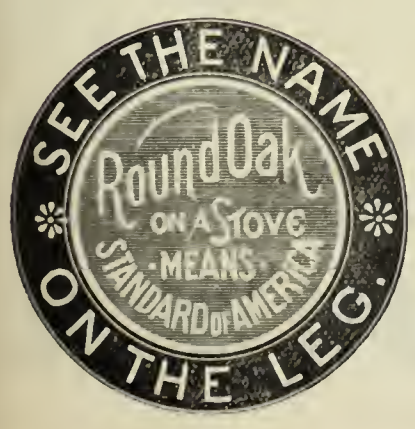


1897 GOLD COIN BASE BURNER.

THE LEADER

Of our Extensive Line.

A Wonderful Heater.

Constructed upon scientific principles, it has larger radiating surface and more cubic inches of hot air circulation than any stove on the market.

We have in our assortment FOUR distinct series to select from, which enables us to supply any demand.

A "*GOLD COIN AGENCY*" is a valuable one. You can secure it on most favorable terms. Write us for information and prices.

Chicago Stove Works, CHICAGO. AND **Bussey & McLeod Stove Co.,** TROY, N. Y.

Here's A New Line

IT WILL PAY YOU TO LOOK INTO.

8 STYLES, 32 SIZES.

Latest and most modern ideas in range construction.

Right and left hand ovens.

Surplus heat from oven utilized to heat an upper room without expensive fittings.

PROGRESSIVE GOODS FOR PROGRESSIVE DEALERS.

We want to tell you all about this line, its prominent features, its great superiority and ***its low prices.*** A postal request from you will bring you a little book which will do our talking.

THE MT. PENN STOVE WKS., Reading, Pa.

PHILADELPHIA STORE, 111-113 N. 2nd STREET.

AN AGE OF PROGRESS

Which is aptly illustrated in our line of Heating Devices. This is especially true in our White and Blue Flame Oil Radiators, which are so constructed that each burner can be used independently, thus regulating the temperature of the room as desired, and are absolutely odorless, as well as more economical than any other style of heating stove, and more convenient and ornamental. We have added to our line of White Flame Radiators the Blue Flame, which after a most thorough trial we do not hesitate to recommend to the public. For economy of fuel it has advantages over other styles of oil burners, as the Blue Flame makes a more intense heat.

We also call attention to our Cylinder Oil Heating Stove, which for durability, simplicity and quick lighting and the price must become one of the most popular heating stoves on the market.

In addition to our line of White and Blue Flame Oil Heaters, we make a line of eighteen different styles of Gas Radiators and Heaters; we also make twenty different styles and finishes of Gas Mantel Grates.

We are confident it will be in the interest of all who deal in this line of heating devices to inform themselves thoroughly of our line before making their arrangements for the coming season.

Send for Catalogue.

THE DANGLER STOVE & MFG. CO.,

CLEVELAND, OHIO.

WHOLESALE AGENTS.

UNION STOVE WORKS, No. 70 Beekman St., New York, N. Y.; for Eastern New York, Northern New Jersey, and New England states.

DIEL & Co., Syracuse, N. Y.; New York, all West of Albany and East of Buffalo.

MT. PENN STOVE Co., No. 111 North 2nd St., Philadelphia, Pa., and

THE COLONIAL STOVE Co., No. 70 North 2nd St., Philadelphia, Pa.; Eastern Pennsylvania, Delaware, and Southern New Jersey.

ARMSTRONG STOVE & MFG. Co., No. 24 South Charles St., Baltimore, Md.; Maryland and Virginia.

J. C. BARTLETT, No. 632 Liberty Ave., Pittsburgh, Pa.; Western Pennsylvania.

E. H. HUENEFELD, No. 225 East 9th St., Cincinnati, O.; Southern Ohio, Southern Indiana, and Kentucky.

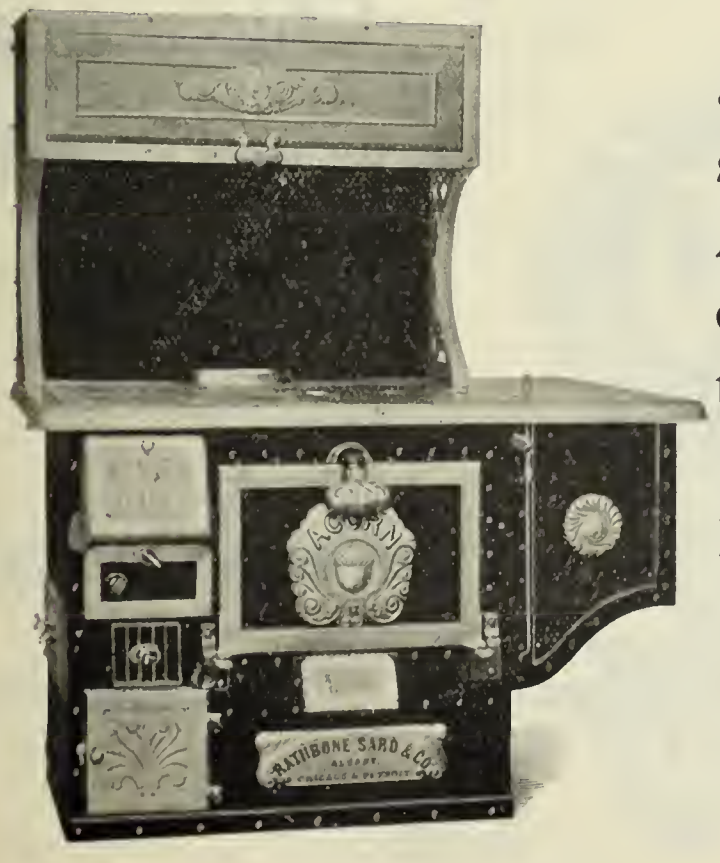
The Active Acorn.

A Specialty Without an Equal.

Thousands of these ranges have been sold since its introduction this spring. At times it has been difficult to fill orders, so great was the demand.

We claim for the Active Acorn that it is a sure and quick worker; more durable than any cheap steel range. Is easily repaired when necessary. Has a great number of selling features. Will not get broken or damaged in shipment, and is the handsomest and quickest selling range ever made.

Remember, the Active Acorn is not a steel range. It is made of heavy cast plates, with a steel oven. It resembles steel ranges in its shape only.



Prices are about the same as are charged for common sheet iron ranges, and the Active Acorn will outlast three or four of these inferior patterns.

If you don't sell it you are losing valuable trade.

Rathbone, Sard & Co.,

Albany, N. Y. Chicago, Ills. Detroit, Mich.

Eastern Foundries, ALBANY, N. Y.
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Is generally the one who has the agency
"MICHIGAN" Stoves and Ranges. Merc
already established are always eager to purcha

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Largest Makers
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DETROIT, C

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f the celebrated lines of "GARLAND" and
nts residing in places where an agency has been
e the goods when an opportunity presents itself.

e lines are complete.
ey are always ahead of the times.
ey are the best known.
e prices are right.
ey are the easiest to sell.

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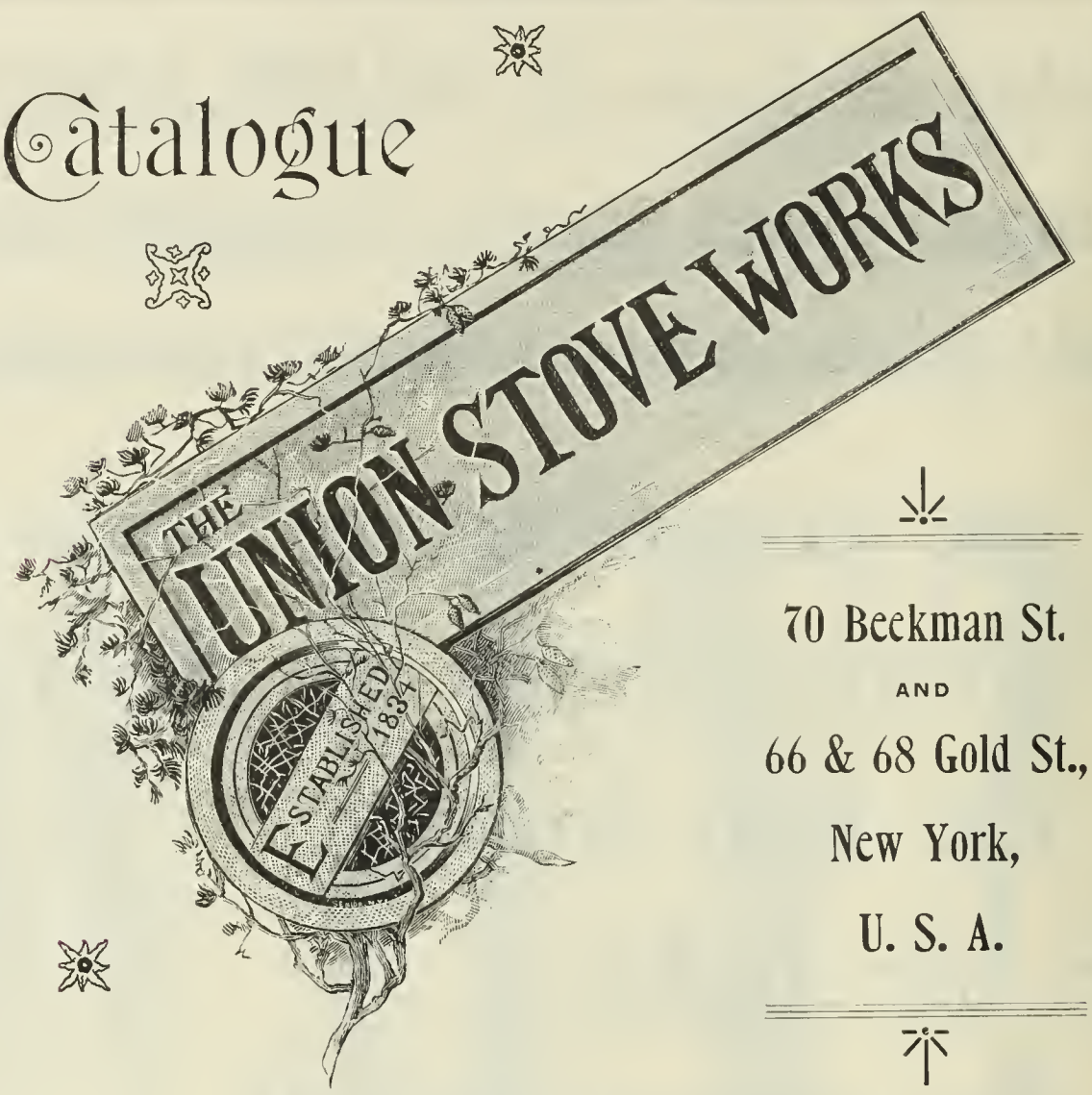
World,

CAGO, BUFFALO.

1897

WITH SUPPLEMENT.

Catalogue



70 Beekman St.
AND
66 & 68 Gold St.,
New York,
U. S. A.

MANUFACTURERS OF

Stoves, Ranges, Heaters,

GAS RANGES AND APPLIANCES,

ETC., ETC.,

We present a fac-simile of the cover to our ***161-page*** Catalogue, every page of which is teeming with interest ***for you.***

The ***immense*** variety of ***Stoves, Ranges, Fire Place Heaters, Furnaces, Laundry Stoves, Gas and Oil Appliances,*** is too great for special mention here.

Won't you become acquainted with its contents by sending for a copy?

THE UNION STOVE WORKS,

70 Beekman and 66 & 68 Gold Sts., New York City.

Cast Openwork, in two parts, hinged at back, allowing cylinder to be tipped back for removing Fount and Lighting.

Cylinder of Russia Iron with Removable Top and Window Frame Nickel Plated.

Base and Cast Openwork in Black Japan or Nickel Finish.

No. 351, Full Nickel Finish.
" 353, Base and Openwork Black Japan Finish

ONE OF 16

Styles of...

MILLER OIL HEATERS.

Don't fail to send for Catalogue No. 57, just out. It contains illustrations of our entire line, many new patterns and new features. They will sell and give perfect satisfaction.

EDWARD MILLER & COMPANY,

STORES: 63 Pearl St., Boston, Mass., and 28-30 West Broadway, New York.
Factories and General Office, Meriden, Conn.

Richmond RANGES

THE DEALER

Wishing to Supply only the Best should Acquaint Himself with

THESE PRODUCTIONS.

ECONOMICAL,
DURABLE AND EFFICIENT.

A REPUTATION OF THIRTY YEARS.

RICHMOND STOVE CO., NORWICH, CT.

Richmond FURNACES

No. 59.

Our gas appliances are as near perfection as possible.

The Acme Gas Stove.

PATENTED.

For Natural Gas.

20 styles and sizes.
Perfect combustion.

Lustre Gas Stoves for Artificial or Natural Gas.

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H. ADLER, Tr.,

14 and 16 Wood St.,
PITTSBURG, PA.

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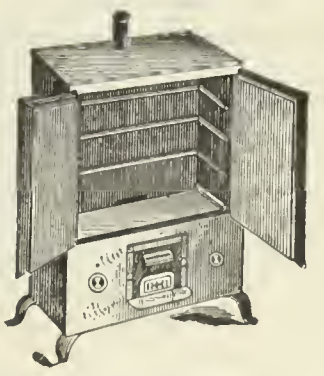
BLODGETT'S PATENT PORTABLE OVEN

FOR

Hotels,
Steamships,
Confectioners,
Public Institutions, &c
Core Baking,
Bluing,
Hardening Rubber Goods,
Bronzing,
Hardware Specialties, &c.



The only Oven Baking by Perfect Circulation of Hot Air.

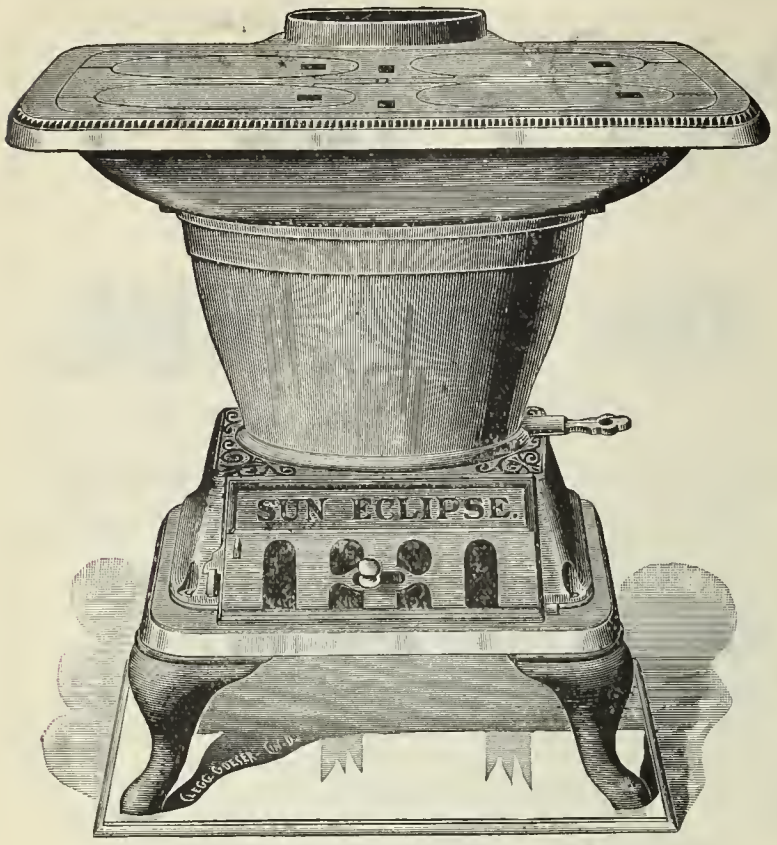
Made in ten sizes. Send for Catalogue.

— ALSO —

Bicycle Enameling Ovens.

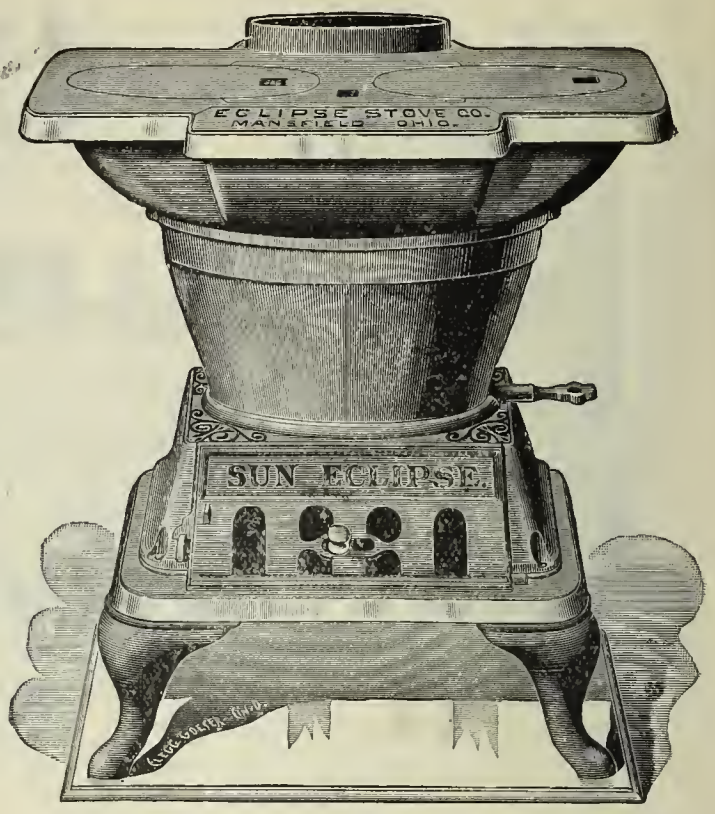
THE G. S. BLODGETT CO., Mfrs.

BURLINGTON, VERMONT.



SUN ECLIPSE.—Four-Hole.

★ EVERY STOVE WARRANTED ★



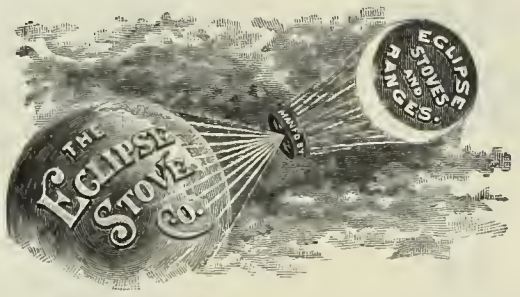
SUN ECLIPSE.—Two-Hole.

Working Day and Night.

That's what we are doing in the effort to meet the demand for

Eclipse Stoves and Ranges.

GET INTO THE BAND WAGON.



The Eclipse Stove Co.

Mansfield, Ohio.

REPOSITORIES:

For Minnesota, No. Dakota and So. Dakota:—MINNEAPOLIS, MINN., H. E. COOK, Mgr., No. 208 Nicollet Ave.
For Nebraska, Western Iowa and Black Hills:—OMAHA, NEB., OSCAR MILLSAP, Mgr.
STREVELL HDW. CO., Agents for State of UTAH.

Maple Clermonts.

There is no better stove in the market than this. That is what those who have ordered sample stoves say, and they order again a greater number.

We know they are right, because we have done honest work on this stove.

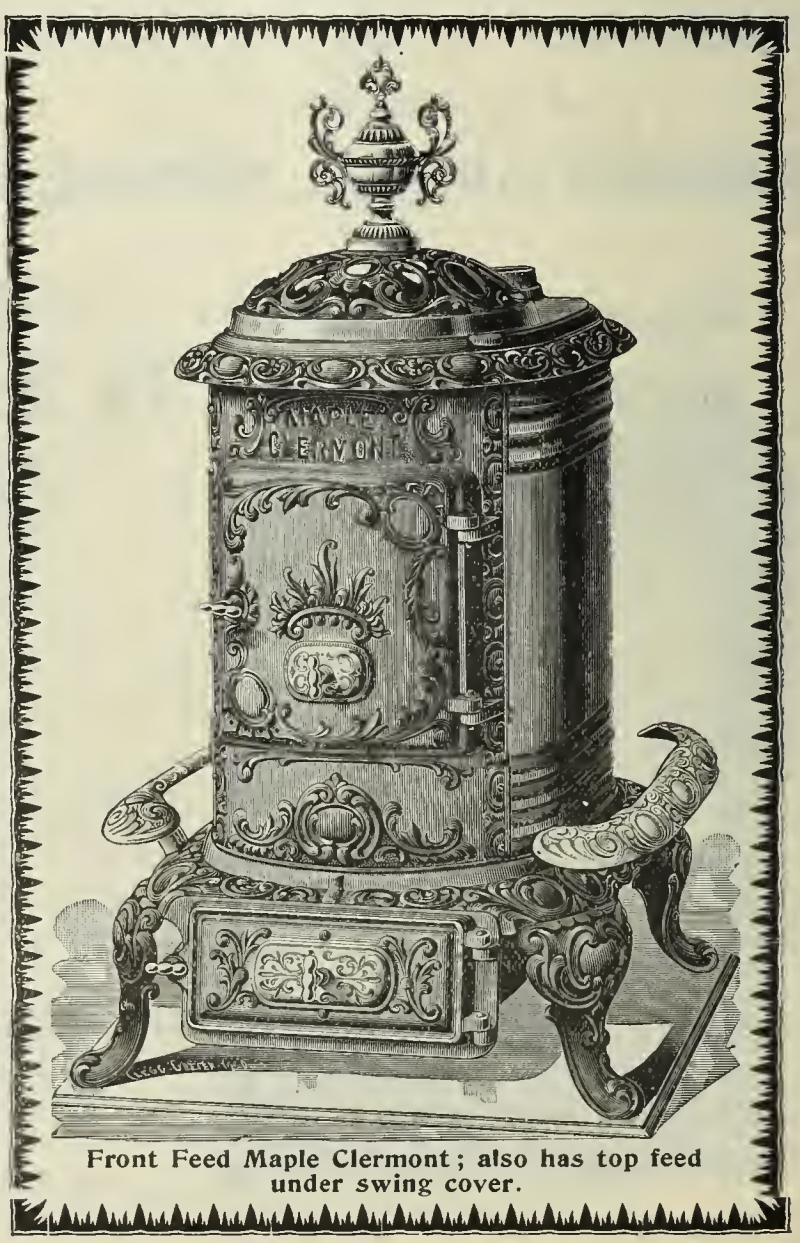
LARGE ASH PANS. Ground doors and screw registers. Strictly air tight. Perfect fire-keepers. Shaking draw-center wood grates. Large convenient top feed. Large door feed with smoke guard. Heavy cast lining all around, extending above fire limits. Cast tops and bottoms. Extra heavy polished steel bodies corrugated to prevent buckling. Screw draft registers. Nickel foot rails, name plates and panels. Ornamental swing cover and spun urn.

These are by far the finest, handsomest and best built stoves in the market, and they are amply protected by patents.

Both styles made in four sizes—18, 22, 24 and 28.

THE GEM CITY STOVE CO.,

DAYTON, OHIO.

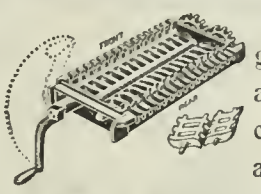


Front Feed Maple Clermont; also has top feed under swing cover.

MAGEE "GRAND" MAGEE

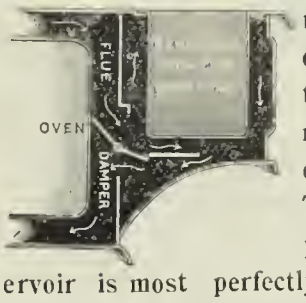
Showing Range with Cabinet Base and Tea Shelf.

Write us about it.



It is the ONLY grate by which a continuous fire can be kept for an indefinite time without impairing the baking qualities of the range.

By removing plate (as shown) **the Grate can be drawn out** without disturbing the linings. **Reservoir** can be removed from or attached to Range by removing end jamb. The "Magee patent" reservoir is most perfectly arranged. [See cut.] The water can be heated **very quickly** and **perfect operation** of the Oven maintained.



Made in all the usual Sizes and Styles, 7-18, 8-18, 8-20 and 9-20.

"There is pleasure as well as profit in selling this range."

REMEMBER the name "MAGEE," and that we have a full and complete line of Ranges, Furnaces, Combination, Hot Water and Steam Heaters, fully warranted. CORRESPONDENCE SOLICITED.

MAGEE FURNACE CO., *Makers Highest Grade Heating and Cooking Apparatus for all uses.*

32-38 Union St., BOSTON.
86 Lake St., CHICAGO.
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WE CHALLENGE

any one to produce a Range that is better in any respect than the

Grand Apollo

"The Peer of any in the East."

CONTINENTAL STOVES
BUCKWALTER STOVE CO.
ROYERSFORD, PA.

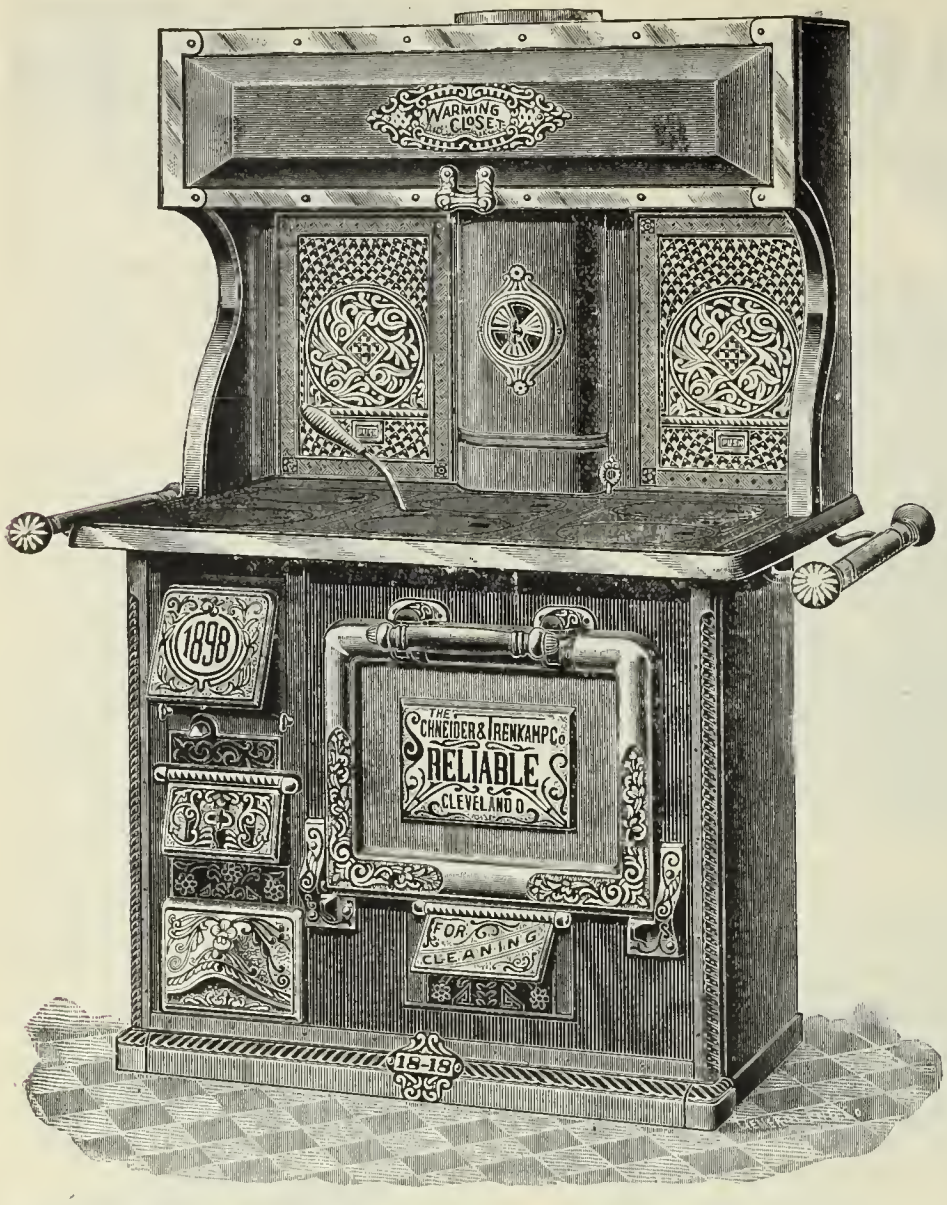
Please the People.

Write for Prices.

Buckwalter Stove Co.,

"Continental Stoves,"

ROYERSFORD, PA.



Reliable Steel Ranges

Made in a Reliable Factory by Reliable Manufacturers known the world over for making only Reliable goods, and are handled by all Reliable Stove Dealers, are purchased by Reliable People. If you have a RELIABLE, your servant will be reliable, as it is a pleasure instead of a task to do all kinds of culinary work with a RELIABLE after using any other make of range.

There are a few other well made and well finished ranges on the market, "But not so many," and none of them equal the "RELIABLE."

A FEW RELIABLE FACTS.

The Best Proportioned Range!
The Most Highly Finished Range!
A Range Constructed of the Highest Priced Patent Leveled Wrought Steel.
Our Fire Box Linings for 1898 are the heaviest placed in any range!
Our tops will never crack from heat!
The RELIABLE is the best made, costs more to make and is the most popular range of the day!
Also made in the combination style for coal, wood, manufactured and natural gas.
Send for catalogue.

MANUFACTURED BY

The Schneider & Trenkamp Co.,

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To Rout "Those Peddlers"

Who threaten to steal your steel range trade by selling from wagons, you need only to fully inform your neighborhood of their methods of doing business and victory is yours. The way to expose these people is to disseminate among your customers the information that

VAN'S NEW PACIFIC

with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal, is the latest, best and handsomest Steel Range ever offered, and that you can offer them terms simply "out of sight" compared with that of the peddler. Try it.

Write for Cat. and Prices.

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John Van Range Co.

Warerooms:—419 ELM ST.;

Factories:—6-8-10 and 12 HOME ST.,

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Star Jewel.

LOOK

AT THESE WEIGHTS:

192. 240. 325.

Why, at our price this stove is cheaper than grate castings for repairs.

The S. J. is handsomely finished, perfectly fitted; the legs are short, thus bringing heating surface near the floor; it has large ash pan, large feed door, large anti-clinker opening, and extra large combustion chamber.

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40, 42, 44 and 46 Union Street, **BOSTON, MASS.**

Monarch Blue Gas Flame Oil Heating Stove.

The phenomenal success of the "Blue Flame" Oil Burner of the past two years has created a "Macedonian Call" for a heater made on the same lines, and the "Monarch" steps forward to supply the demand. It has been on the market one year, and for the season of 1897-8 is presented with several important improvements which a year's experience has suggested and we offer it with all confidence in its efficiency, cleanliness, intense power and great comfort.

There are no others with Blue Flame.

Top tilts back to light the Burner or to remove the Tank. Mounted on Casters. The entire Stove is richly nickeled and beautifully polished. Brass Tank. Burner cannot creep up. Will not smoke or smell. There is only one "Blue Flame" Heater and that is the "Monarch."

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THE MONARCH STOVE CO.

MANSFIELD, O., U. S. A.

DANVILLE STOVE & MFG. CO., Danville, Pa., New York, N. Y., and Phila., Pa., Agents for Eastern States.

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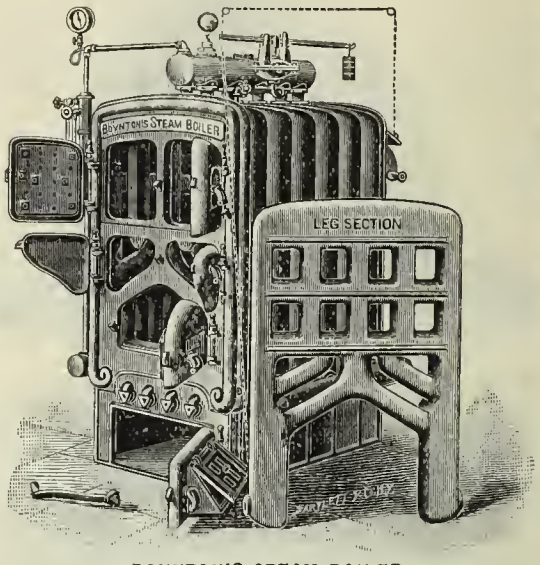
**HOT WATER HEATERS,
STEAM BOILERS,
FURNACES,
RANGES, ETC.**

BOYNTON'S NEW GAS TIGHT FURNACE.

Remember it is the name BOYNTON we wish you to recall when in want of steam heaters, hot water heaters, furnaces, ranges, etc. Our goods are for sale by best dealers all over the country.

Send for Catalogue and Prices.



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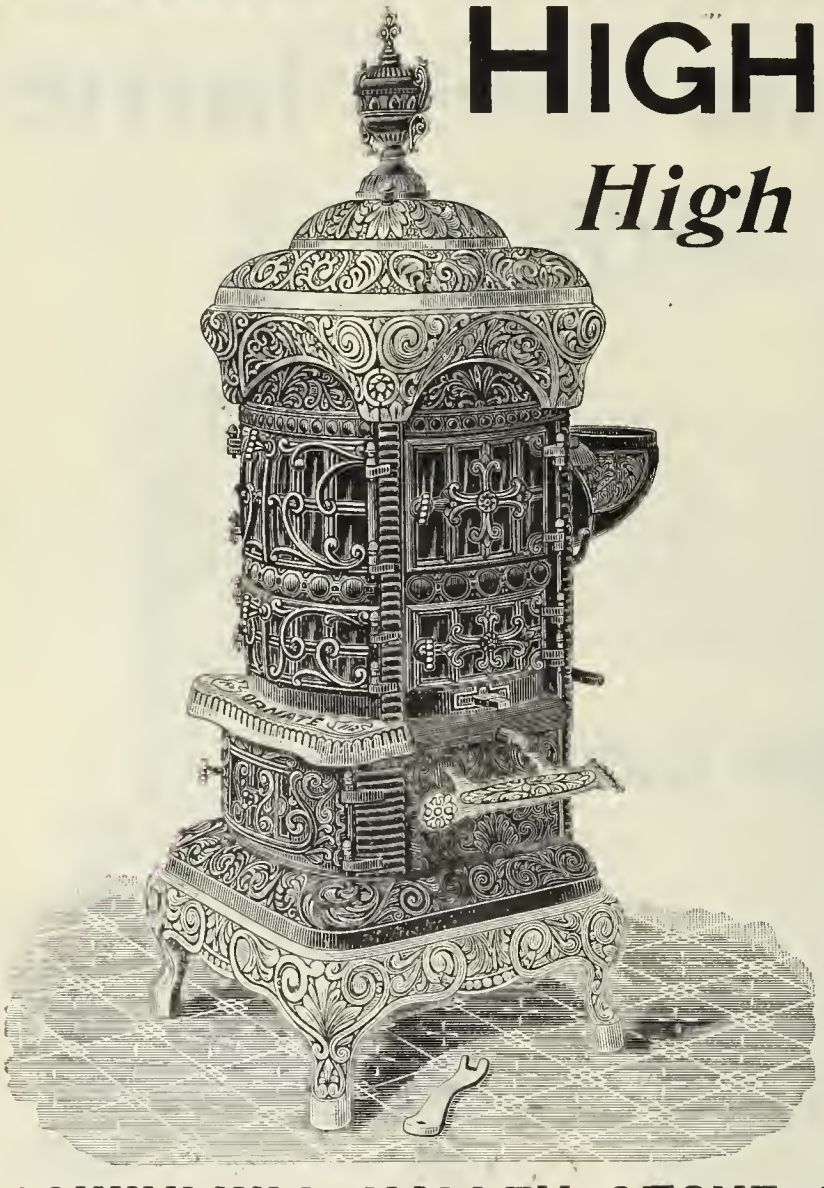
The Boynton Furnace Co.,

207 and 209 Water St., New York. 44 and 46 Dearborn St., Chicago.

HIGH, YET LOW.

High in Grade, Low in Price.



IF YOU want a "seller" you need not look beyond this stove---you need only show it and name the price to get the order. If you are in business for "profit" send us a postal for a description and the price of this stove; it will be a cent well invested, as you will find.

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ROYAL HEATERS.

All Kinds of Heating Apparatus.

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Sold on their Merits, not on their Antiquity.

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Strictly up to date in every particular.

Triangular or draw-centre grates; cast or steel radiators.

The best hot water combination in the world.

Points of merit by the dozen. Satisfactory in proportions, weight, quality and fitting of castings.

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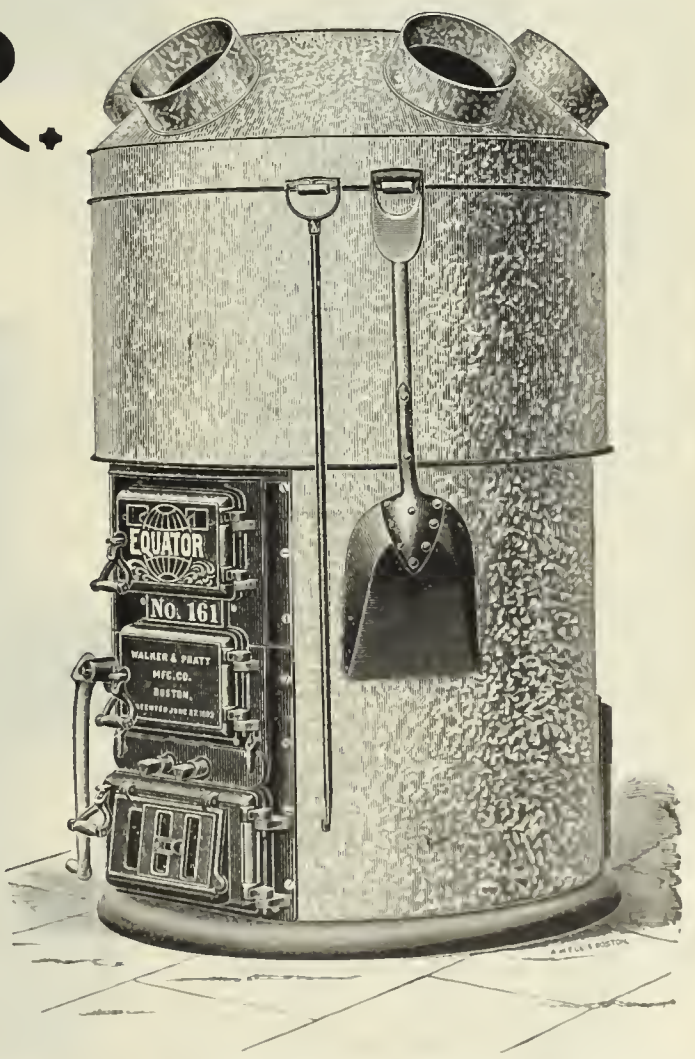

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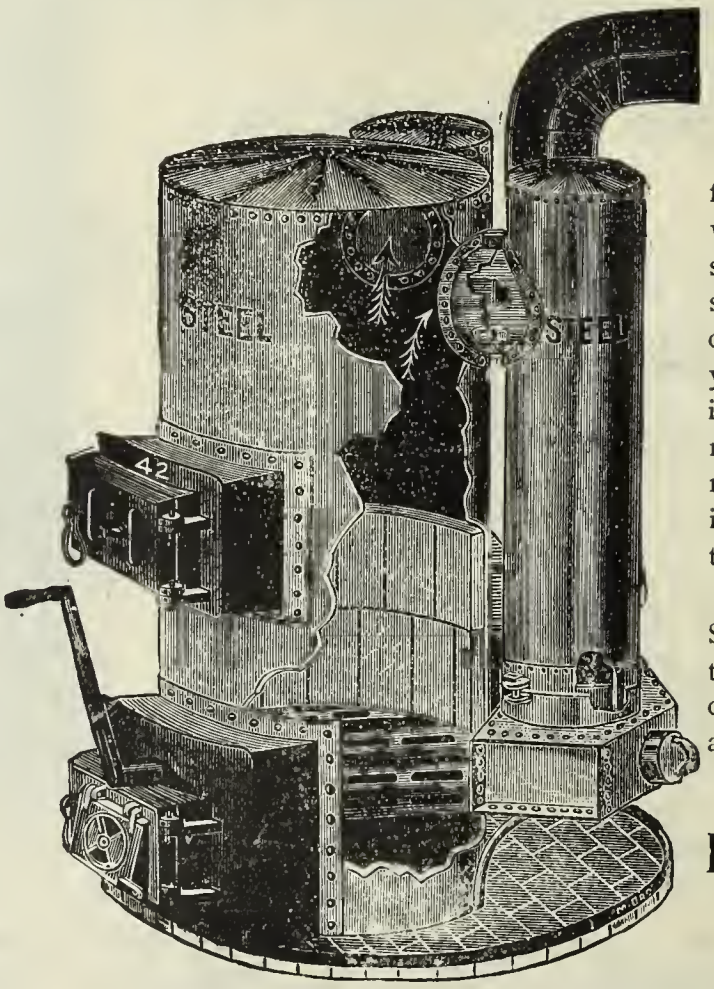

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If you are looking for a furnace which will give the best of satisfaction after it is sold, that can be sold cheap and still show you a good profit, that is superior to any furnace your competitor may secure, then there is no use to look farther.

The Front Rank Steel Furnace leads them all. Write for catalogue, prices, etc., and be convinced.

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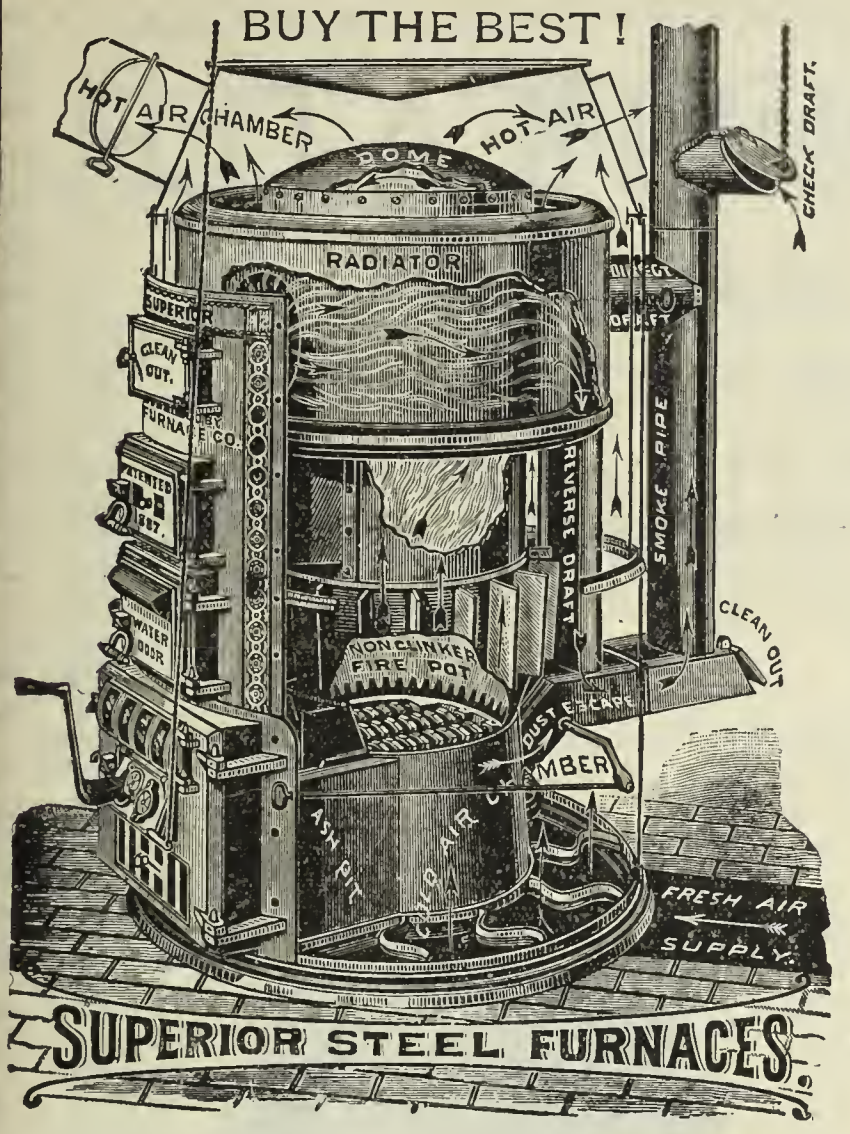

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FURNACES AND HEATERS
ARE DURABLE.

Office of
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For heating capacity, durability, and economy of consumption of fuel, I think from my experience I can state your furnace has no superior. It has been in constant use every winter from October, 1891, has done its work most satisfactorily, and no part of it has broken or been burnt out. Since you placed it in position I have not been under one cent's cost for breakage or repairs of any nature.

I will add that many friends of mine, who, upon my recommendation. have had your furnaces put in their dwellings, have spoken of them in the highest terms.

Yours truly,
E. D. F. Brady.

Thoroughly Modern in every Feature.

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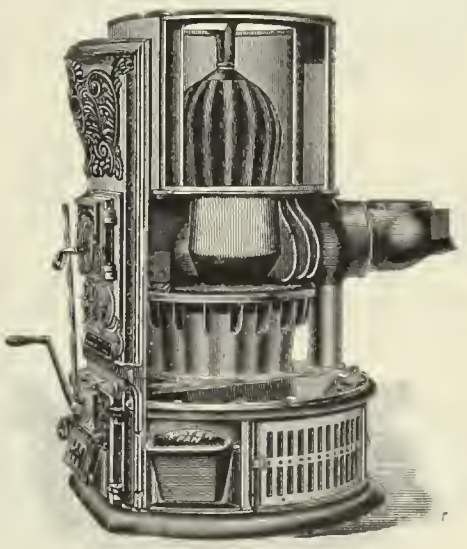

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It is entirely new in construction and far in advance over others of its class for economy, power and easy management.

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HIGH GRADE.... ....MEDIUM IN PRICE.

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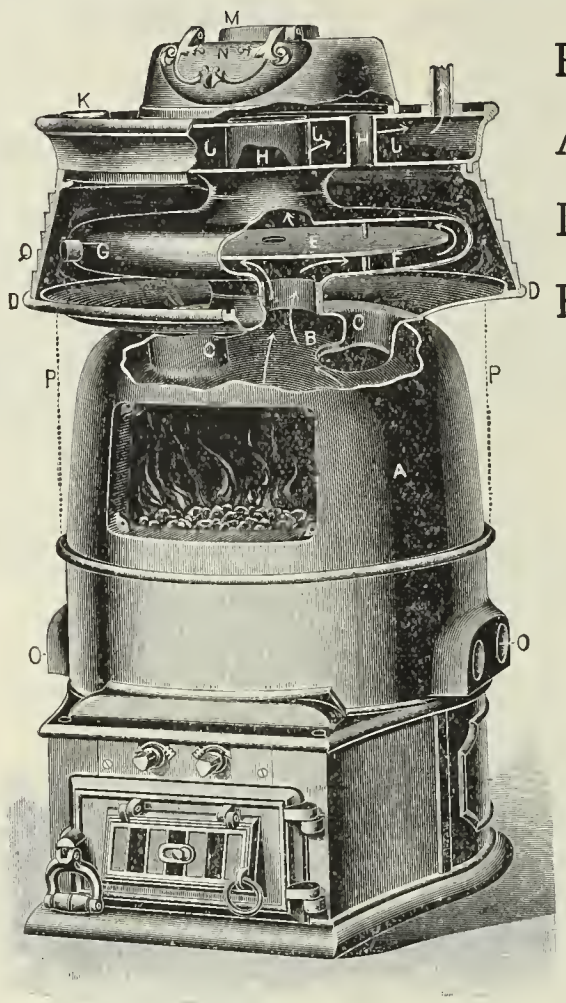

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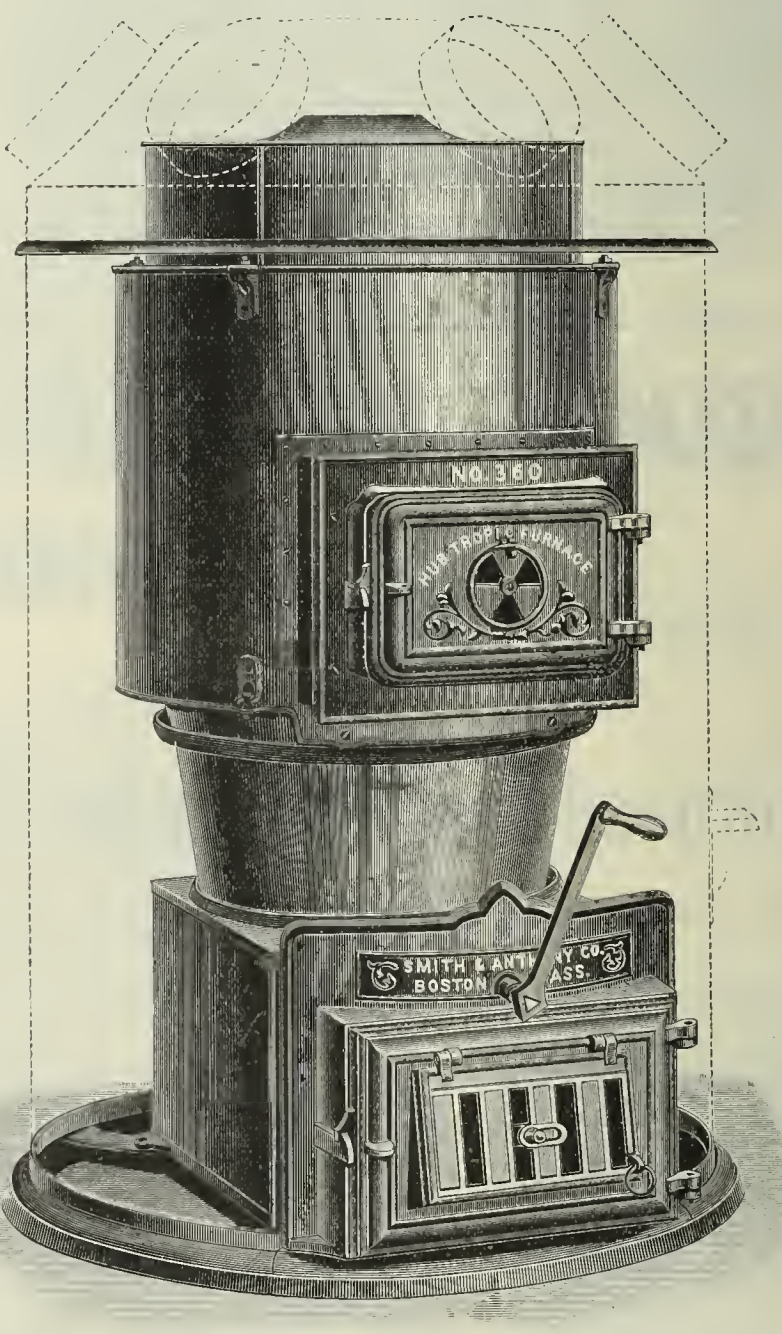
Exceptionally simple and easy to set up.

A novelty in this construction is the special Hot Air Attachment, making a Combination Heater at slight expense.



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With Steel Plate Radiator and Supplementary Heating Drum.

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Just the Thing for Contract Work.

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They are Economical in Fuel.
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GREATEST VARIETY.
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STANDARDS OF EXCELLENCE,
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THE VERY BEST.
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A powerful and economical heater that has stood the test as a practical house warmer for 12 years.

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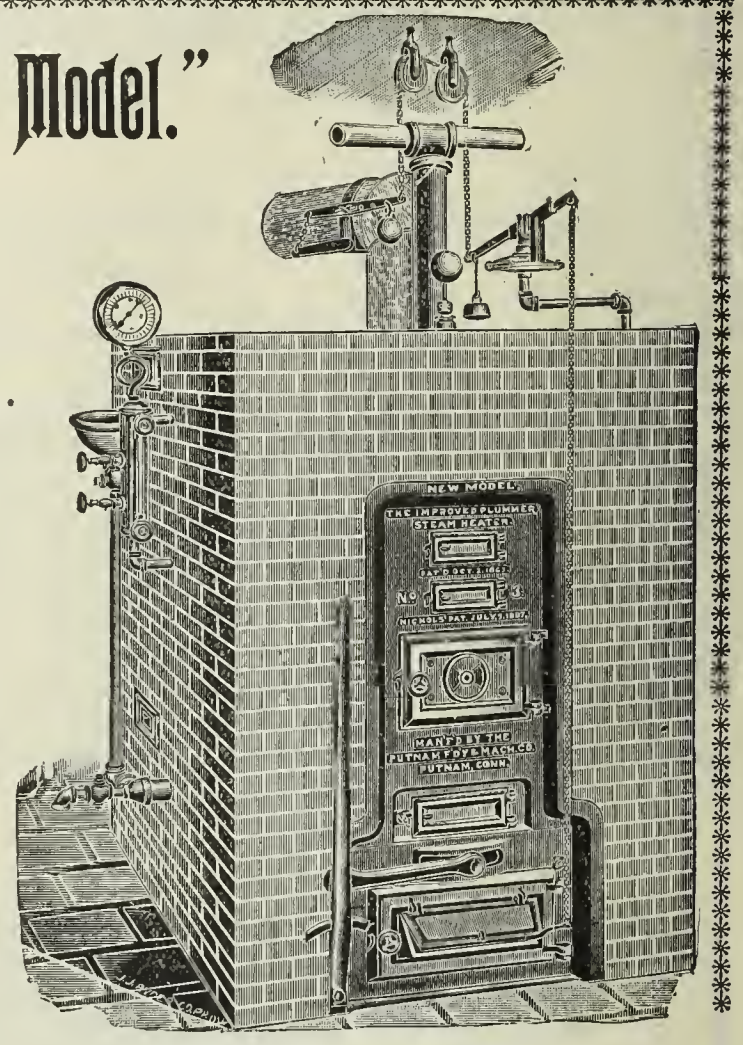

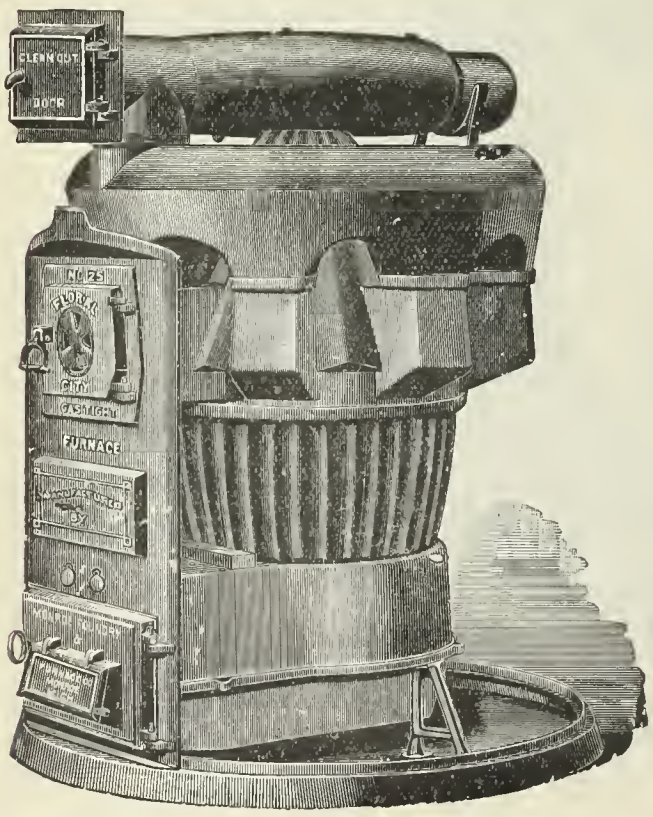

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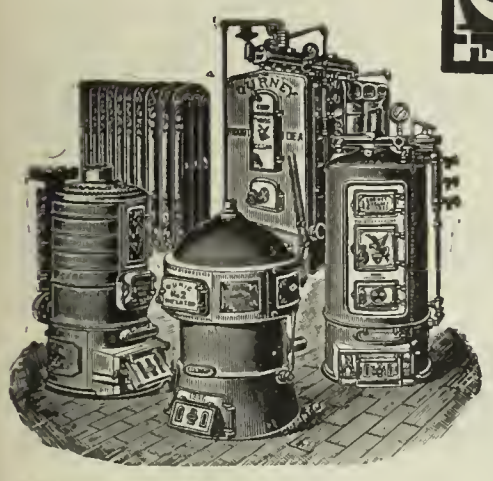

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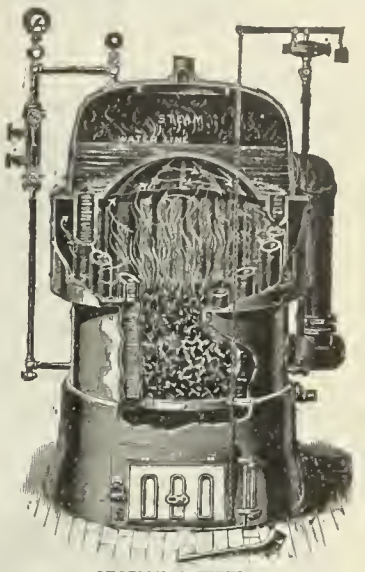

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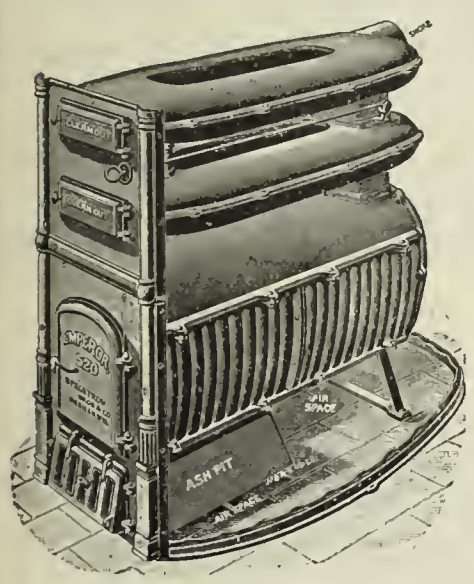
DORIC SEAMLESS TUBULAR STEAM BOILER.



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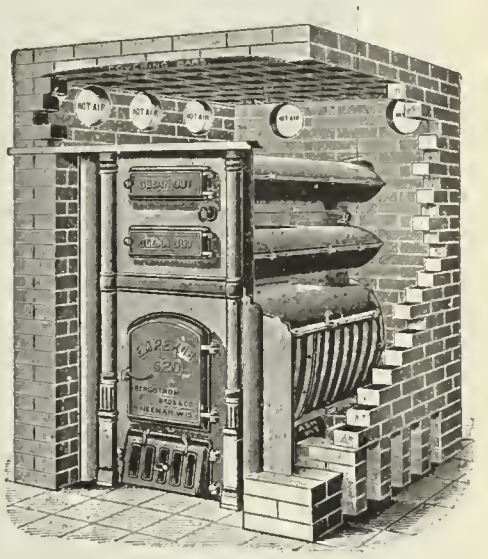

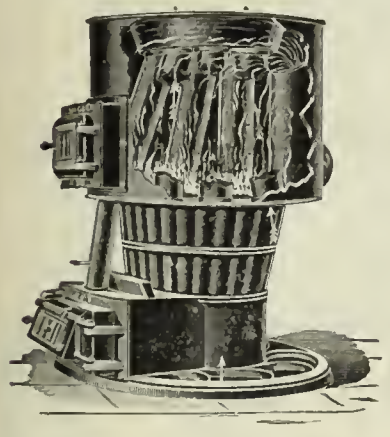

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Get the **best** in the market.
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There is positively nothing that can get out of order in any way, and the whole apparatus is GUARANTEED TO LAST A LIFETIME if it has reasonable care.

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Will Control the Fire in any
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Spend a cent

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If there is a better furnace made it is not in this country.

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We manufacture and many of the largest furniture dealers use them. If it pays them it will pay you, and a single trial will demonstrate this to be a fact. Write us for Catalog and price list.

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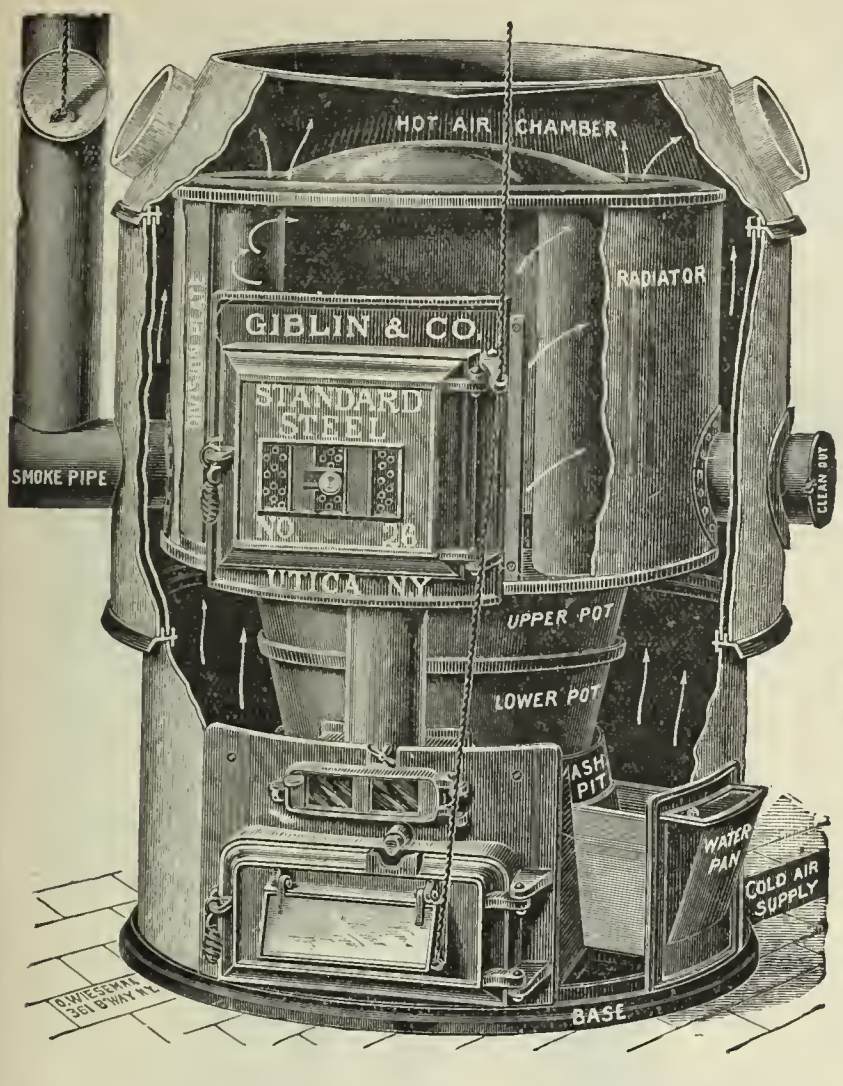
FURNACE PIPES.

FURNACE PIPES



YOU WILL BE

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IT GIVES

all the heat to the house and wastes no fuel. It economizes time and money, and gives

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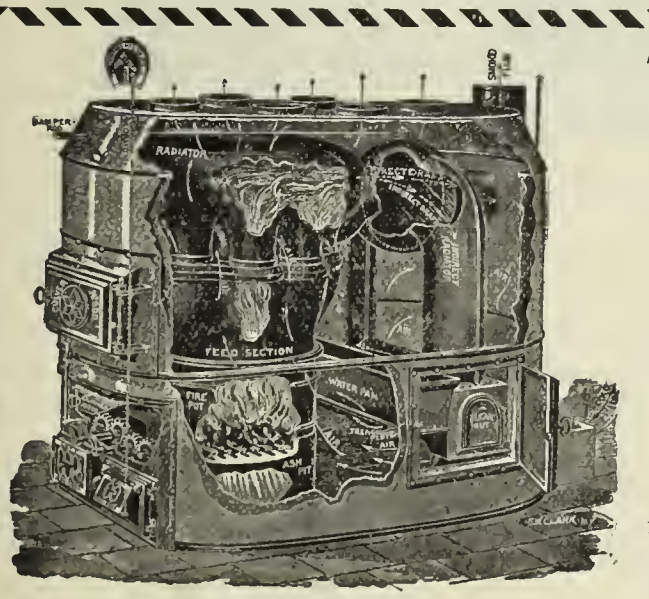

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Double and Single Oven Ranges, with special features and latest designs. Steam and Hot Water Boilers.

Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

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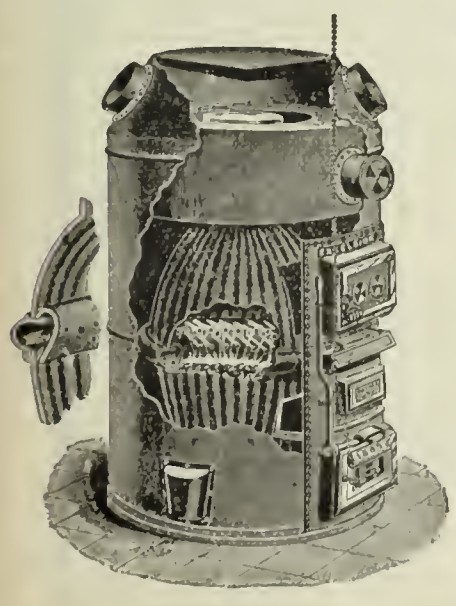

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ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
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THE EXCELSIOR STEEL FURNACE CO.,

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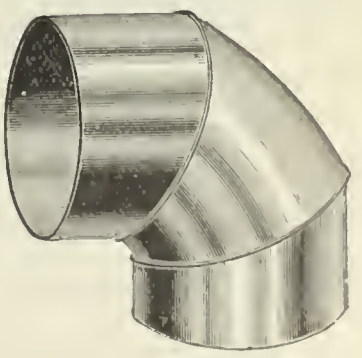
See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



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AND
HOT WATER FITTERS' TEXT BOOK.

Prepared for the Steam and Hot Water Heating Course at the New York Trade School, with Supplementary Chapters on House Heating, Specifications and Surface Estimating.

BY

THOS. E. McNEILL.

140 Pages, numerous Illustrations and Diagrams, 5 x 7 in., Cloth, $1.00.

This manual, comprising nearly 200 questions and answers, and other matter, is intended as a Pocket Companion for the Steam and Hot Water Fitter and the Apprentice. The contents are purely practical and the questions or problems set forth are answered in a simple and direct manner.

It begins with first principles and progresses in so thorough a manner that many of the seeming mysteries of steam and hot water fitting can be readily understood.

The various systems of steam and hot water heating are explained, as well as the various appliances and apparatus used with them, and the manner of connecting them is described.

The book supplies in simple form information that is much needed by the trade on determining the size of pipes for flow and return, the amount of radiation, the size of indirect stacks, how to make an estimate of the materials for a job without error, and how to make out a specification and contract.

Plans of various systems are given and a full account of all the details of a successful heating job.

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" 9. High Pressure Steam Heating.
" 10. High and Low Pressure Steam Heating and Power Plant
" 11. Exhaust Steam Heating.
" 12. Power Fan or Blower System of Heating and Ventilating.
" 13. Design. Estimate. Specification.
" 14. Dwelling House Heating.
" 15. A Successful Heating Job.

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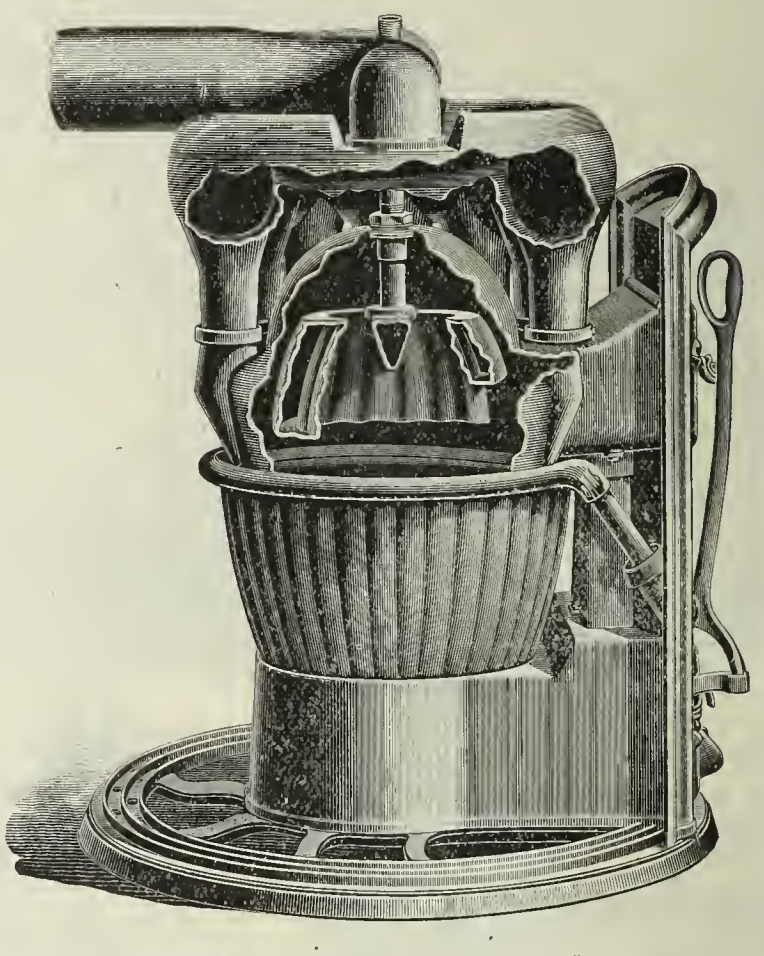

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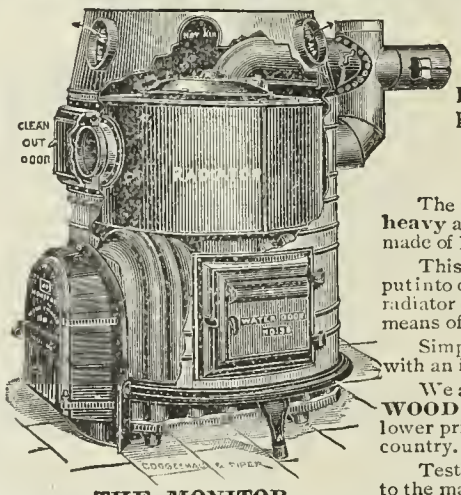

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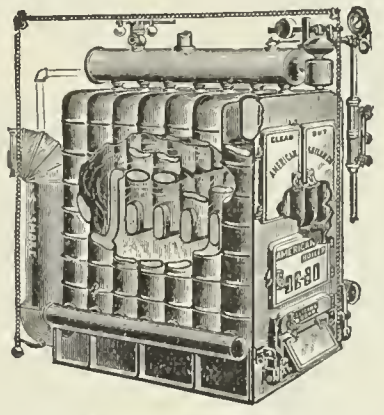

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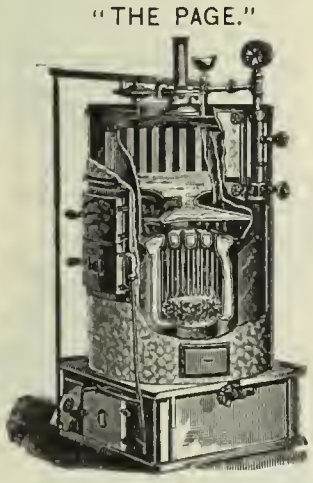

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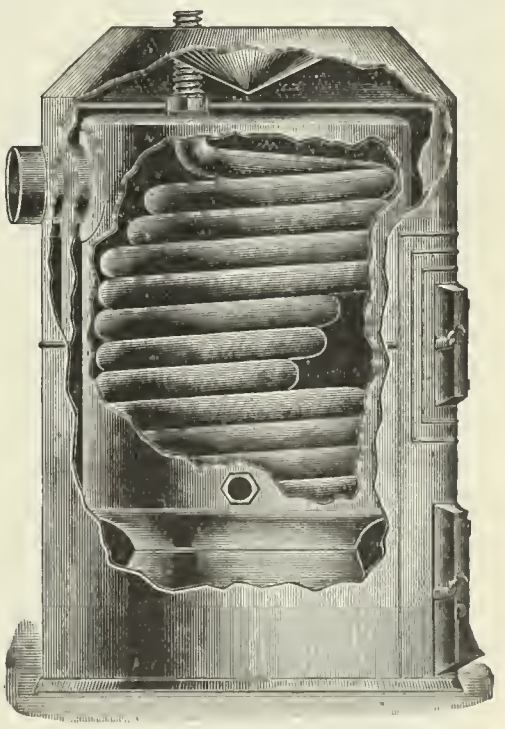

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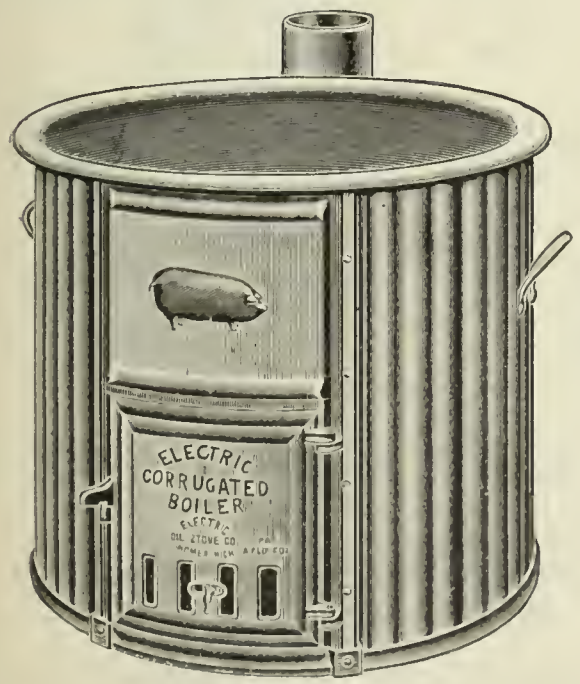

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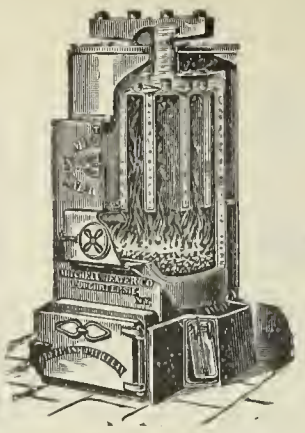

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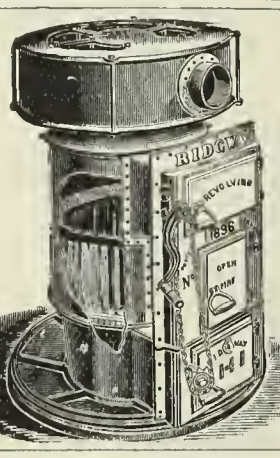

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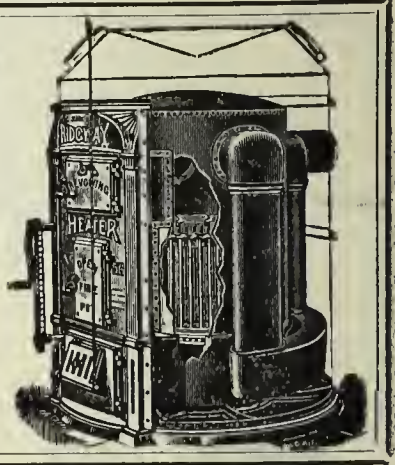

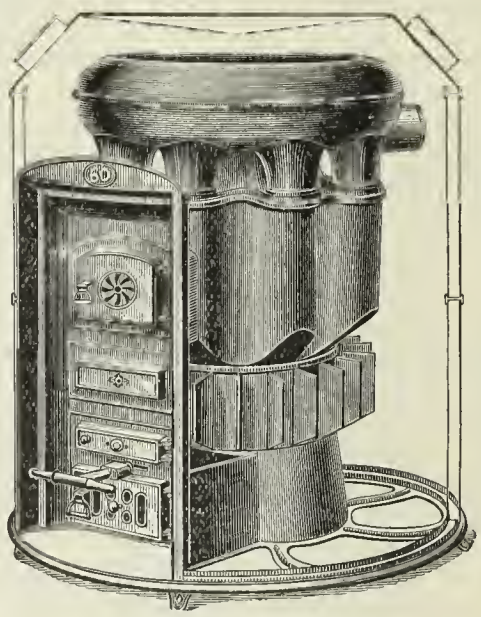

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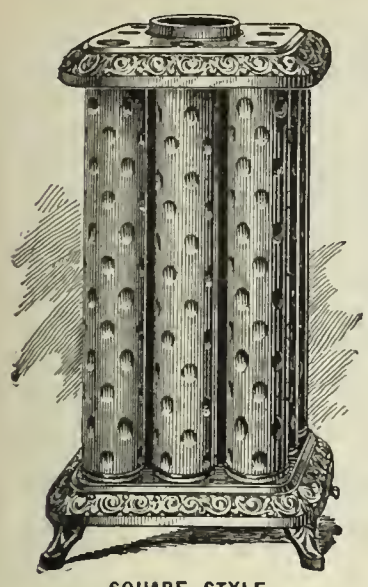

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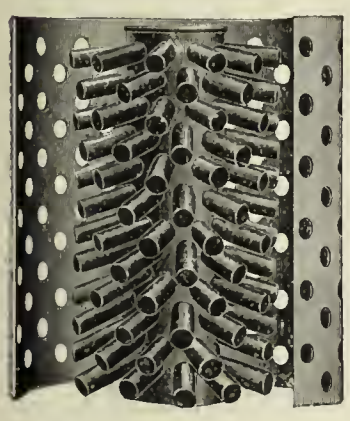

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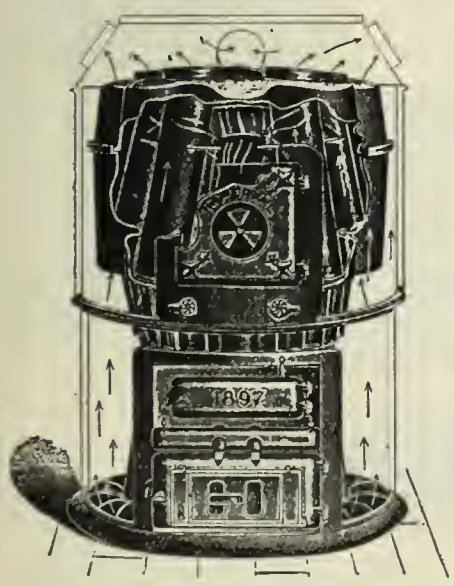

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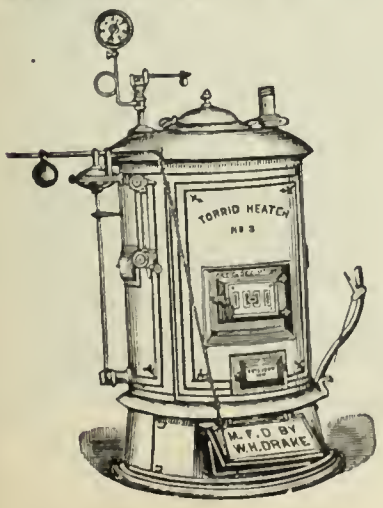

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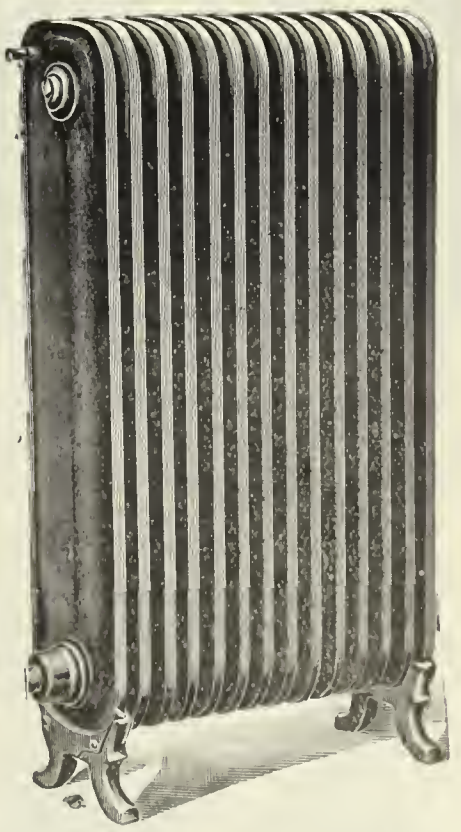

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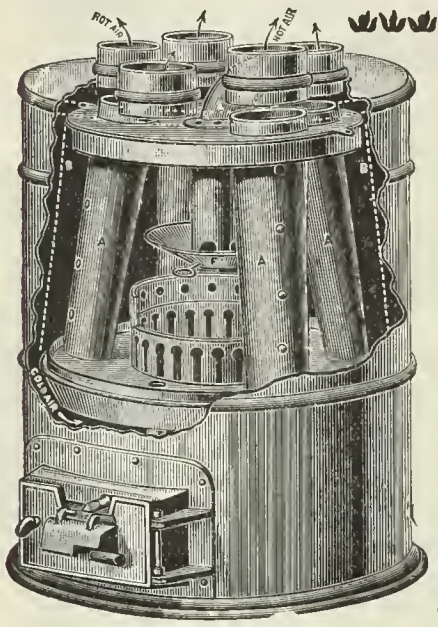

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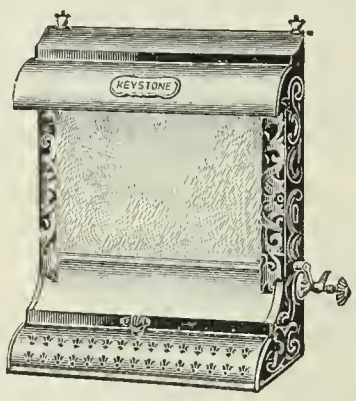

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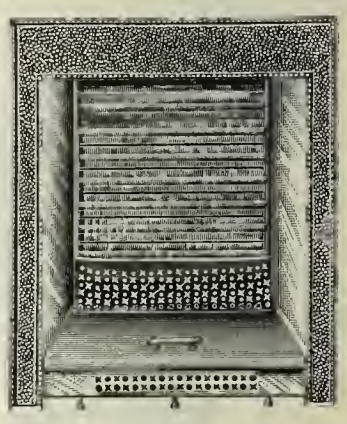

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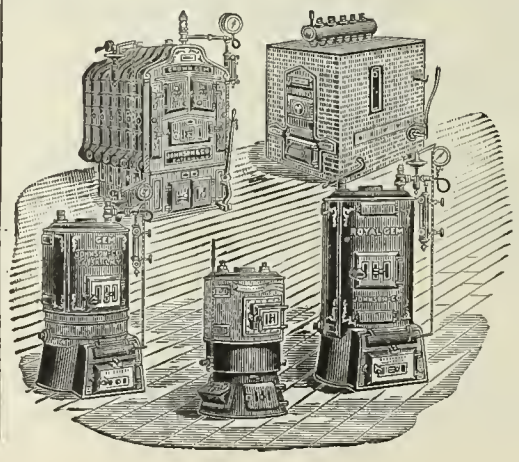

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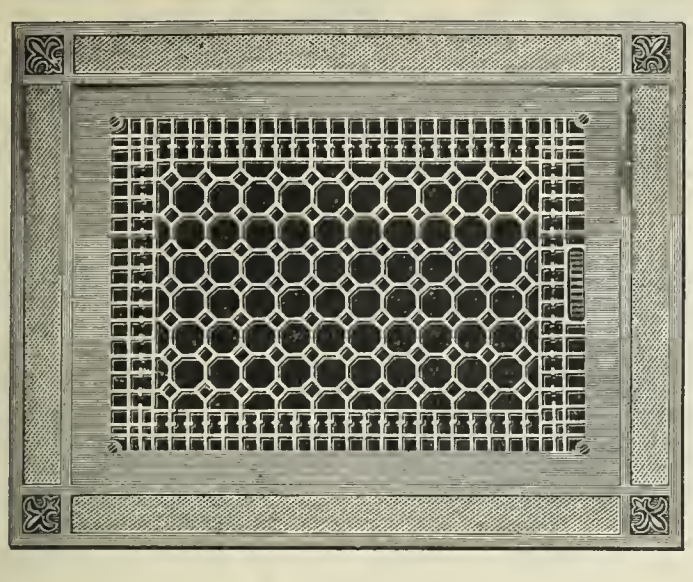

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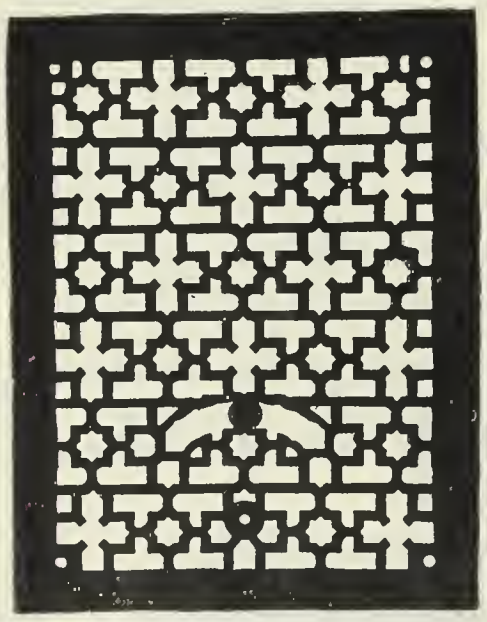

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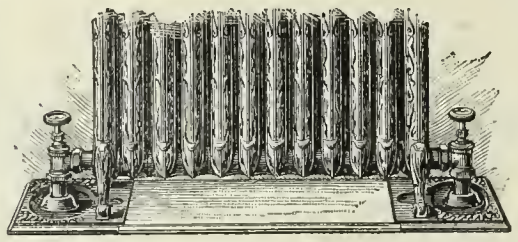

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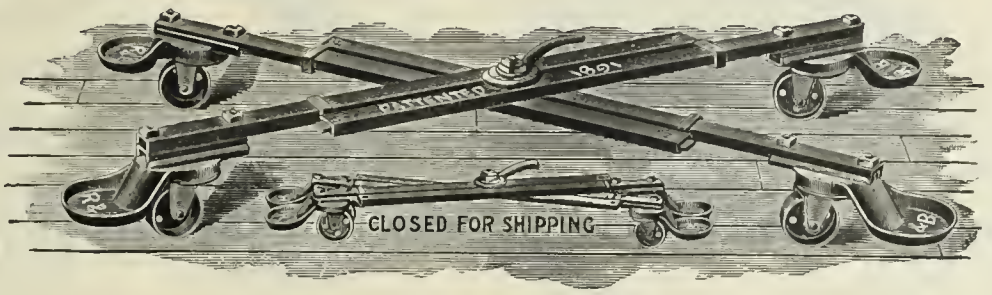

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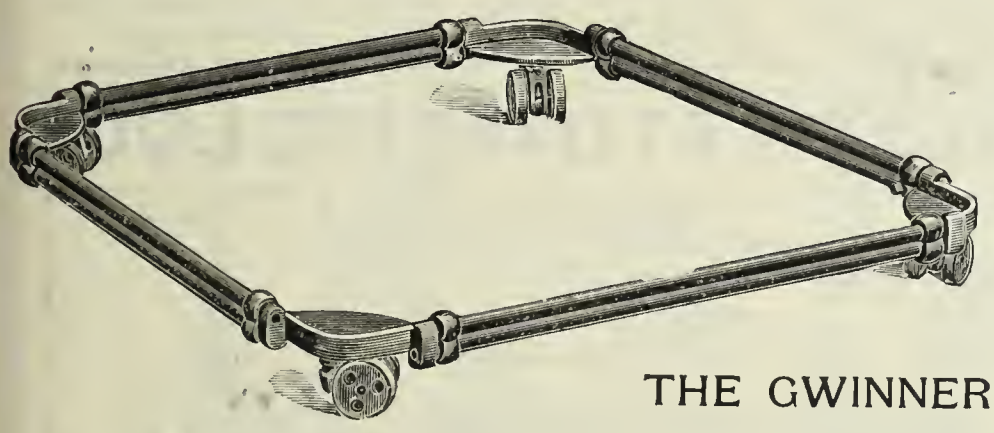

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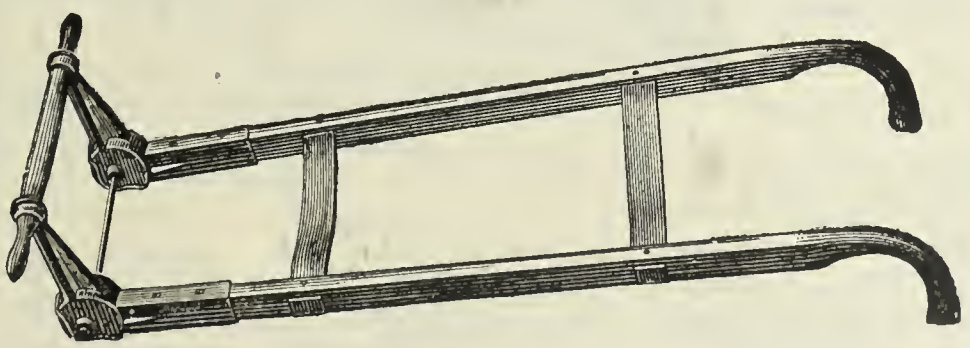

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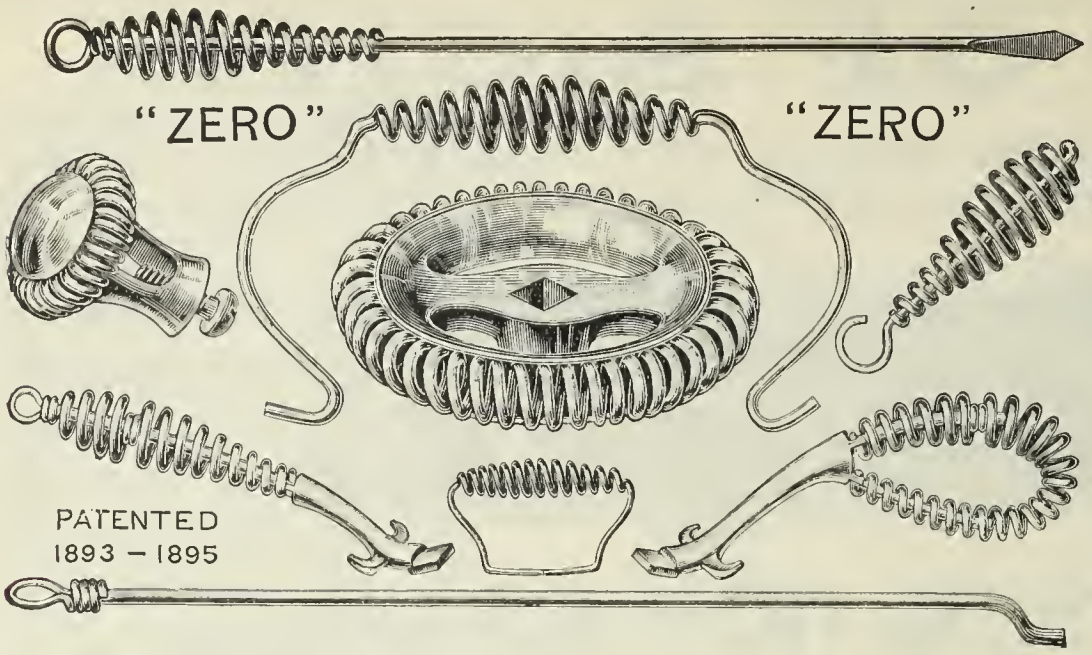

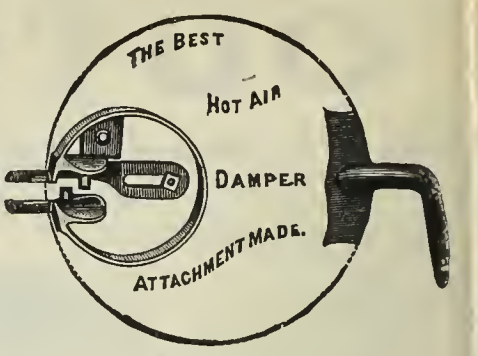

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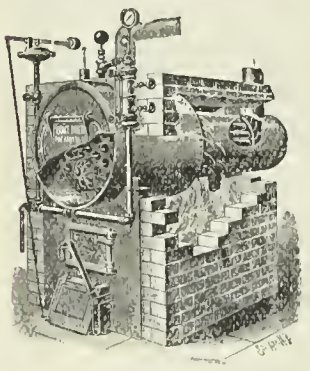

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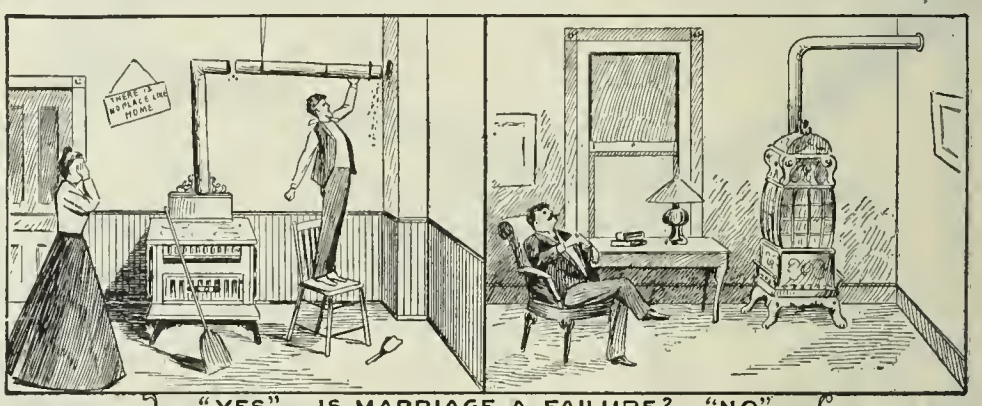

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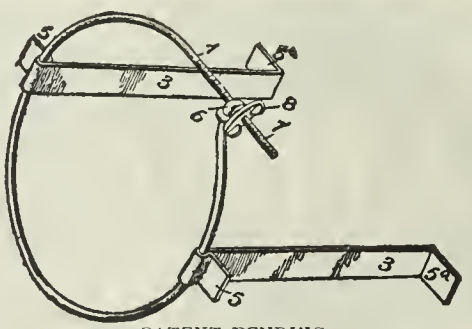

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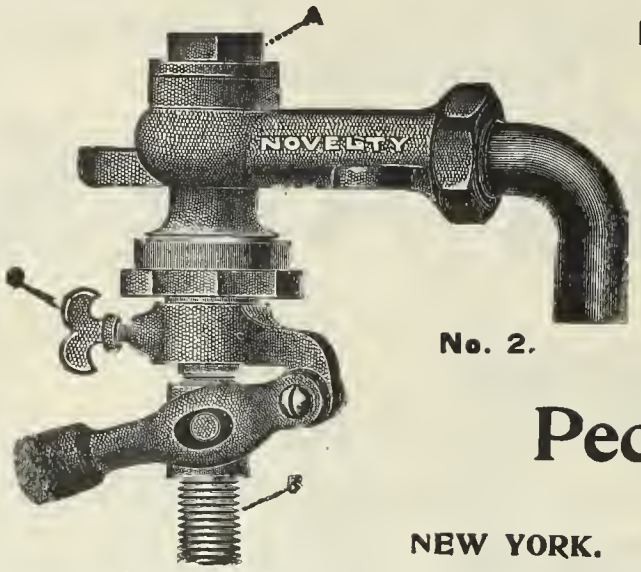

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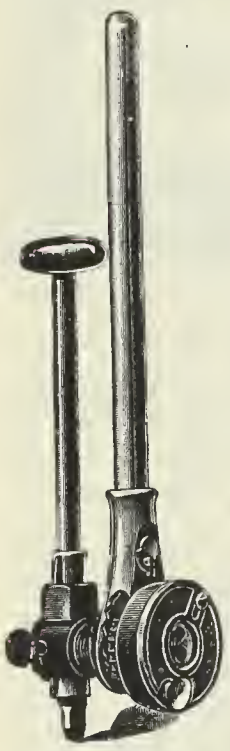

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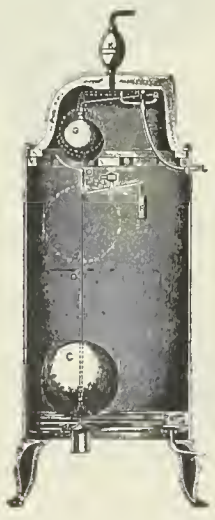

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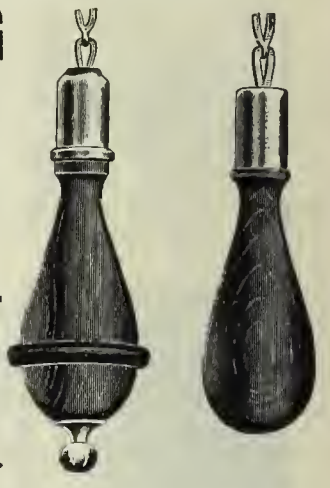

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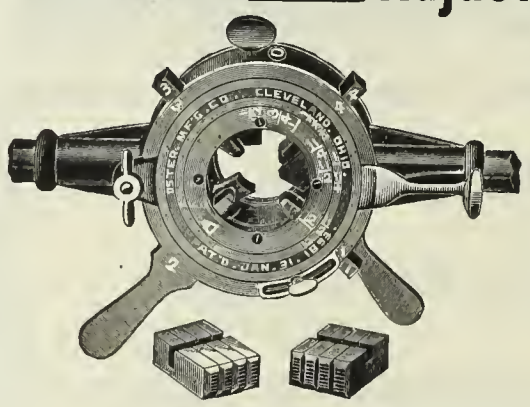

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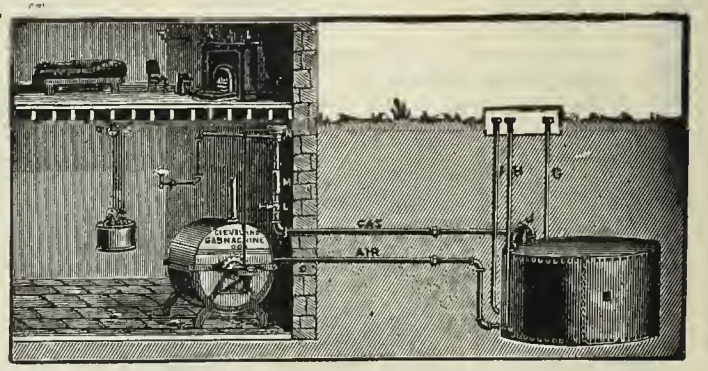

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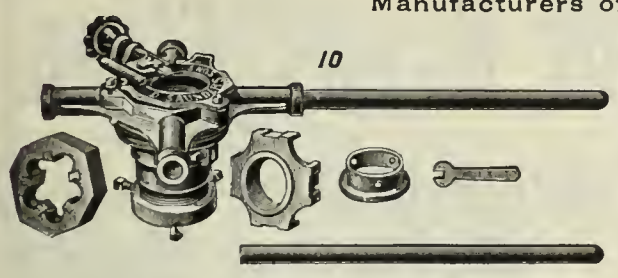

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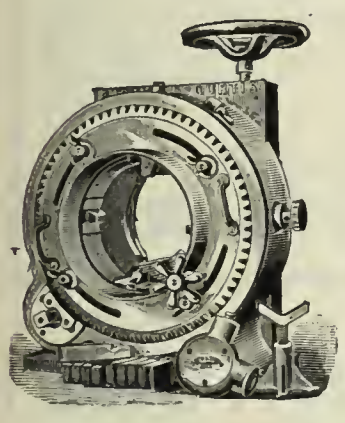

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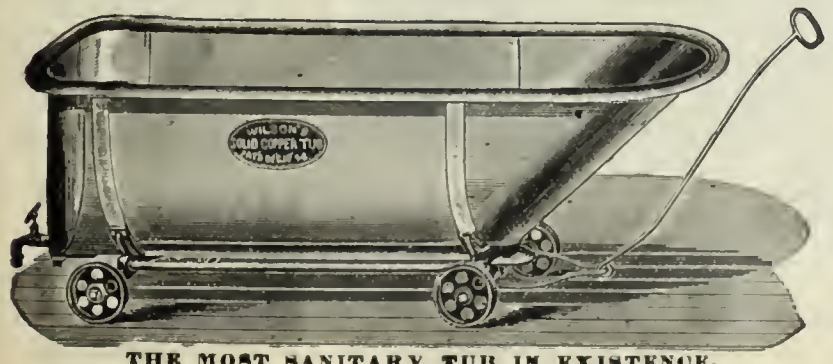

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Also makers of a full line of Galvanized Sheet Iron Wares, Factory Fire Buckets, Oily Waste Cans, Garbage Pails, Chamber Pails, Coal Hods, Oil Cans, Ash Barrels, etc.

SEND FOR CIRCULAR.

HILL'S CHAMPION COOKER

A Steamless and Odorless Cooker with an Iron Base. Keeps the steam and odor from the house.

125,000 NOW IN USE.

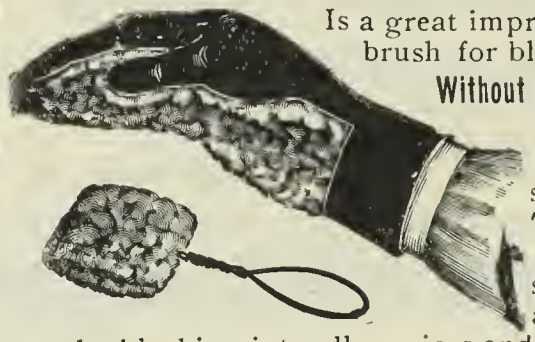
SEND FOR CIRCULAR AND PRICES.

HILL-WHITNEY ALUMINUM CO.

BOSTON, MASS.

Keep Your Hands Clean.

THE PARKS STOVE POLISHING MITTEN AND DAUBER



Is a great improvement over the old stove brush for blacking stoves.

Without getting a speck of blacking on hands.

The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth. **The Dauber** is also made of sheep skin, with the wool on, and so shaped as to readily get the b'acking into all crevices and corners. It is also adapted to polish russet and patent leather shoes, cleaning windows, furniture, etc.

MANUFACTURED BY

PARKS & PARKS, - Troy, N. Y.

DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the

Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

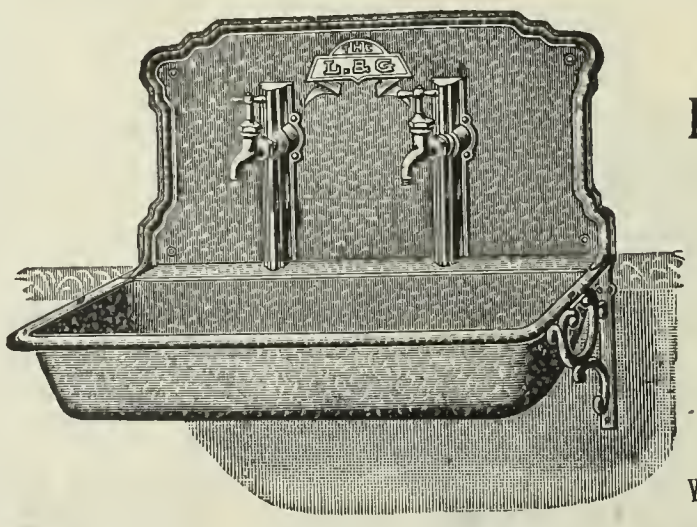
IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces. Can be sold in all seasons.
Length, 10 inches.

Write to Manufacturers for Prices.

WILLIAM VOGEL & BROS., Wythe Ave., Brooklyn, N. Y.



"L. & G." Kitchen and Pantry SINKS AND SINK BACKS,

Painted, Galvanized and Enameled.

Write for Illustrated Price-Lists.

LALANCE & GROSJEAN MFG. CO.

MANUFACTURERS,

19 CLIFF ST., NEW YORK.

CHICAGO. *Branch Houses.* *BOSTON.*

St. Louis Stamping Co.,

ST. LOUIS, MO.

—MANUFACTURERS—

Granite Ironware AND Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: ***NEW YORK. CHICAGO. BOSTON.***

Some Makers Claim to Make the

BEST COAL HODS,

But they don't tell you

WHY THEY ARE THE BEST.

We tell you that our HODS are superior to any in Market

BECAUSE

BOTTOMS ARE RIVETED, not simply snapped or false seamed.

BAILS are half-oval iron or heavy round wire.

EARS are extra heavy wrought iron.

JAPANNING brilliant black, baked hard in Natural Gas Ovens.

GALVANIZING smooth and bright, with beautiful crystalized effect.

We supply you with only fresh, clean goods.

The Retail Dealer should give his Customers the BEST for their money.

We Make Them in All Sizes and Styles.

SIDNEY SHEPARD & CO., Buffalo, N.Y.

(Cut Shows Rope Handles and Re-enforced Bottom.) PATENTED 1896

Corrugated Galvanized Iron Basket.

Corrugated in such manner as to STIFFEN and STRENGTHEN it in Every Direction.

Making it the STRONGEST and MOST DURABLE Basket Known.

Made in any Shape, Size or Style to suit your wants.

Will send sample (1 bushel size) prepaid on receipt of $1.00. Write for our prices.

MANUFACTURED BY

THE METALLIC BASKET CO.,

123 South First St., Cedar Rapids, Iowa.

BATH-TUB SEAT.

Our Patent Detachable Galvanized Iron Bath-Tub Seat, in three sizes, will fit any galvanized wash tub. Seats are guaranteed to hold a weight of 300 pounds. Tub and Seat complete retails at $1.50, with 50 per cent. profit for the dealer.

SEAT FOR BATH TUB
THIS HURTS AND THE WATER SPLASHES ON THE FLOOR.
WHY DON'T YOU BUY A SEAT LIKE MINE
WITHOUT SEAT ATTACHMENT.
WITH SEAT ATTACHMENT

The legs fold and seats are shipped nested in boxes, not less than half dozen to a box.

H. WETTER MANUFACTURING CO., MEMPHIS, TENN.,

SOLE MANUFACTURERS.

—A SMALL number of women have served as letter-carriers in England for many years, and they give general satisfaction. Only a few months ago a noted old postwoman died at Cutsyke, some ten miles from Leeds. From the Queen's accession, in 1837, till 1869 she was the letter-carrier in the ancient town of Pontefract, and was never known to be absent from her duties from sickness during the thirty-two years. Monckton Milnes, first Lord Houghton, took an interest in her career, and was instrumental in obtaining a Government pension for her in her declining years—*New York Tribune.*

—"Do you plead guilty?" asked the Judge as the trembling wheelman was brought to the bar by the relentless cycle cop.

"No, sir," answered the victim, "I was not riding faster than ten miles an hour."

"Your Honor," exclaimed the officer, "he was going twenty miles an hour."

"That is impossible," replied the prisoner. "I was merely keeping up with a trolley-car, and Your Honor knows that if it had been going faster than nine miles an hour these efficient policemen would at once have arrested the motorman."—*Buffalo Express.*

—HE EVIDENTLY was from the rural districts, and therefore his uneasiness upon what presumably was his first visit to a photographer could easily be overlooked. At last, when he was summoned to the operating-room, and caught a whiff of chemicals from the "dark room," he hesitated on the threshold, half-suspiciously. "Come in; come right in," said the camera man reassuringly. "Do you want a vignette?" "N-no, I guess not," replied the old man. "I guess I can stand it without taking anything." "Would you like a photograph of your head only? Or would you prefer one-half length or full length?" inquired the photographer. "Well, now, I'll tell you how it is, mister," remarked the old granger, confidently. "This picter is for a widder in Nebraska who's been writin' to me considerably about gettin' spliced. I reckon she'd ruther have a picter of my whole system if it don't make any difference to you." It didn't.—*Chicago Times-Herald.*

—"YESSUH," said the proud Vine street father, "it weighs ten and a haf pouns, an' it's as fine, healthy a boy as evah yah see, an' it was bo'n on the very day Gen'l Grant was buried over again, an' Ah'm goin' to give 'im a name that'll be appoperate."

"You'll call him Ulysses S. Grant Johnson, I suppose," said the friend who was hearing the news.

"No, sah; nothin' so common as that for my boy. Ah'm goin' to name 'im Mausoleum, sah."—*Buffalo Express.*

THE CENTRAL STAMPING COMPANY,

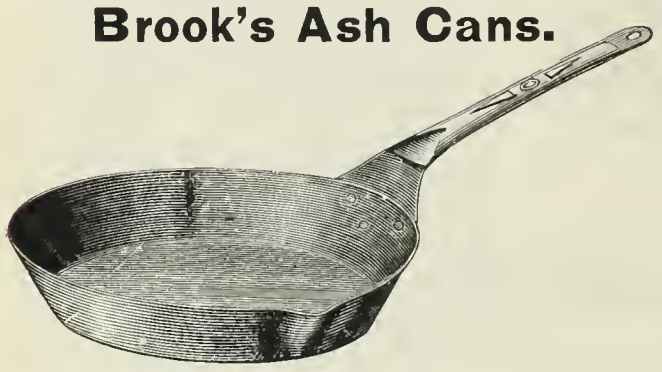
23 and 25 Cliff Street, New York,

MANUFACTURERS OF

House Furnishing Goods

SPECIALTIES IN

Tin Wares, "Steel Edge" Dust Pans, Champion Flour Sieves, Central Watering Pots, Brook's Ash Cans.



Latest Style of Cold Handle Fry Pans.

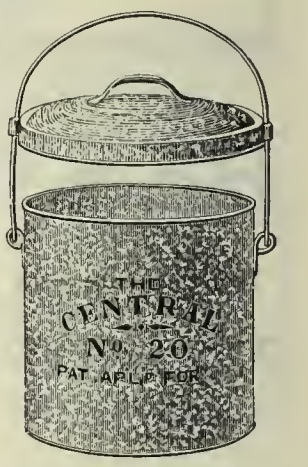
ARTICLES FOR

Kitchen, Farm, Dairy, Table, Factory, Lawn, Stable, Cafe.

New Price List,
Send for Copy.

Proposals Invited.

LARGEST ASSORTMENT.
STANDARD GOODS.

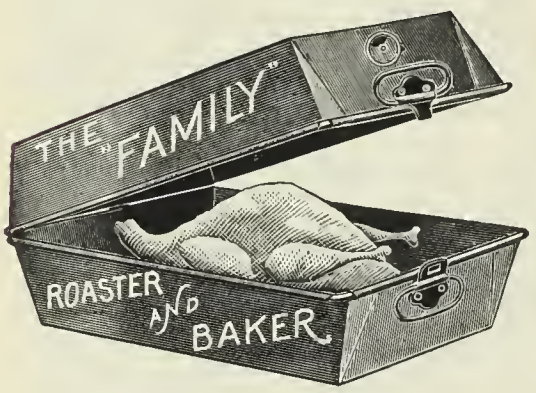


New Ash and Garbage Can.
Cover Always Attached.

We Wish to Introduce to You Our New

"Family" Roaster and Baker . . .

Made from Black Smooth Steel.



Nos.	10	20	30
Inches	8½ x 12½	10½ x 15½	12½ x 17½

The "Family" Roaster and Baker is a well made double roasting pan, the upper part of which is ventilated.

The two parts are joined by a hook hinge, and when closed are held securely together by this hinge in the back and a tongue in front, which slips through a slotted clip that is riveted to the lower part.

Include a sample lot in your next shipment.

THE SIMPLEST AND BEST ROASTER MADE.

MANUFACTURED BY

KIECKHEFER BROS. CO., Milwaukee.

Sold by all Jobbers.

—GIVING HIM FITS.—Arabella (scared)—Oh, mammy! Miss Smiff say her ole man gits fits eb'ry tahm he come home drunk, an' I's 'fraid I cotch 'um."

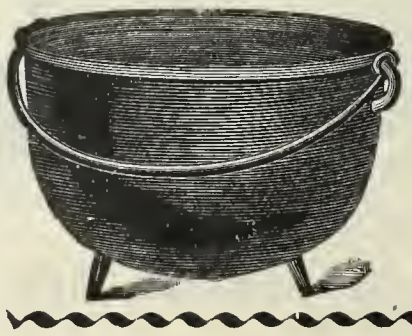
Mammy—G'wan, chile; fits ain' ketchin'.

Arabella—Dey mus be, 'kase Miss Smiff says she give 'um to him herse'f.—*Judge.*

—SHORT SHRIFT.—Uncle—I don't know about lending you any more money. When I lent you money two months ago, you said you wanted it only for a little while.

Nephew—And I didn't have it more than half an hour.—*Der Floh.*

SPERRY'S SUGAR KETTLES.



Light, smooth, full measure and guaranteed perfect. Made from original patterns. Metal, the right kind in the right place. Ask your Jobber for them or write us.

D. R. SPERRY & CO.,
HOLLOW-WARE FOUNDERS,
BATAVIA, ILL.

ROME

TEA KETTLES, RANGE KETTLES, TEA AND COFFEE POTS, WASH BOILERS, STOVE TANKS, &C.,

ARE MADE BY

800 Series. Tin Lined.

Rome Manufacturing Co.,

ROME, N. Y.

Write for Catalogue and Prices.

ROME MEANS PERFECTION.

900 Series. Silver Lined.

W. H. SWEENEY MFG. CO.,

MANUFACTURERS OF

TIN, BRASS, COPPER AND NICKEL-PLATED WARE; TEA AND COFFEE POTS, TEA KETTLES, CUSPIDORES, TRAYS, &C.

66, 68, 70 and 72 WATER ST., and 51 FRONT ST.,

BROOKLYN, N. Y.

The No. 47 Cuspidore,

One of our Best Sellers.

Have 20 other styles in Catalogue.

CUSPIDORES. We make a large line of tin, brass and steel cuspidores with a variety of finishes.

THE NO. 47 CUSPIDORE has proved to be one of our most popular designs. It is made of tin, enameled blue or green, with mottled effect on outside, with inside of top planished. It is the only cuspidore of its kind on the market, and retails readily at 10 cents, yielding the dealer a good profit.

We also Manufacture Tea Kettles, Tea and Coffee Pots, Crumb Trays, Round, Square and Oblong Waiters, and a large variety of other House Furnishing Goods.

SEND FOR NEW CATALOGUE.

Art of Coppersmithing.

A Practical Treatise on Working Sheet Copper Into All Forms.

By JOHN FULLER, Sr.

Cloth Bound; Size, 10 x 6½ inches; 327 pages; 474 Engravings Price, $3.00

THIS book is brought out to meet the needs of a body of sheet metal workers whose trade has never before been thoroughly described. The author acquired proficiency in copper working through a long apprenticeship and many years of actual labor at the bench. The instruction he gives is, therefore, entirely practical, and will be correspondingly valued by those who are in any way interested in coppersmithing. A special feature of the work is the illustrations, of which there are nearly 500, and which add much not only to the interest but to the value of the text, as they show the work in all stages of progress and illustrate all the appliances, patterns and tools. The work is divided into sections, each treating a separate topic, and is thoroughly indexed The style of the writing is exceedingly simple, and the descriptions of work go into the smallest details, a fact that will be especially appreciated by those who read the book for instruction in this handicraft

"This is a veritable storehouse of information, the descriptive matter and the many illustrations being easy of comprehension. In fact, the whole subject is handled in so masterly a manner that any one with ordinary effort and application cannot fail to understand and appreciate it."—*The Plumber and Decorator.*

"This admirable book has been written with abundant knowledge and a clear head. Mr. Fuller appears to have succeeded thoroughly. His book is singularly simple and clear, and yet very minute in detail."—*Railroad Gazette.*

"The work is the most complete consideration we have seen on this subject, and Mr. Fuller tells his story with clearness and force."—*Fire and Water.*

"The author has so well executed his task that I doubt very much whether any other man living could have done it better. The treatise seems to fully justify his claim that it is entirely practical, and of the publishers, that it is exhaustive; since few will be able to name any article made of sheet copper the practical construction of which, or of some strictly analogous article involving the same methods, is not fully and clearly described in the book, from the laying out of patterns through all intermediate steps and processes to its final completion. The book is a much needed and welcome addition to modern technical literature, and should at once be placed in every up-to-date trade school and technical library."—*Engineering Magazine.*

"Mr. Fuller has happily succeeded in a most difficult task, that of writing a book that is at once a practical reference book, and is at the same time a most readable and interesting one—even to those not especially interested in the subject treated. An evident love for the subject permeates the entire work. We must say a good word for the numerous illustrations, which are lucid and simple."—*American Artisan.*

SENT, POST-PAID, ON RECEIPT OF PRICE BY

DAVID WILLIAMS CO., Publishers, - 232-238 William St., N. Y.

HOWARD FURNACES

make the heat

AND DO IT

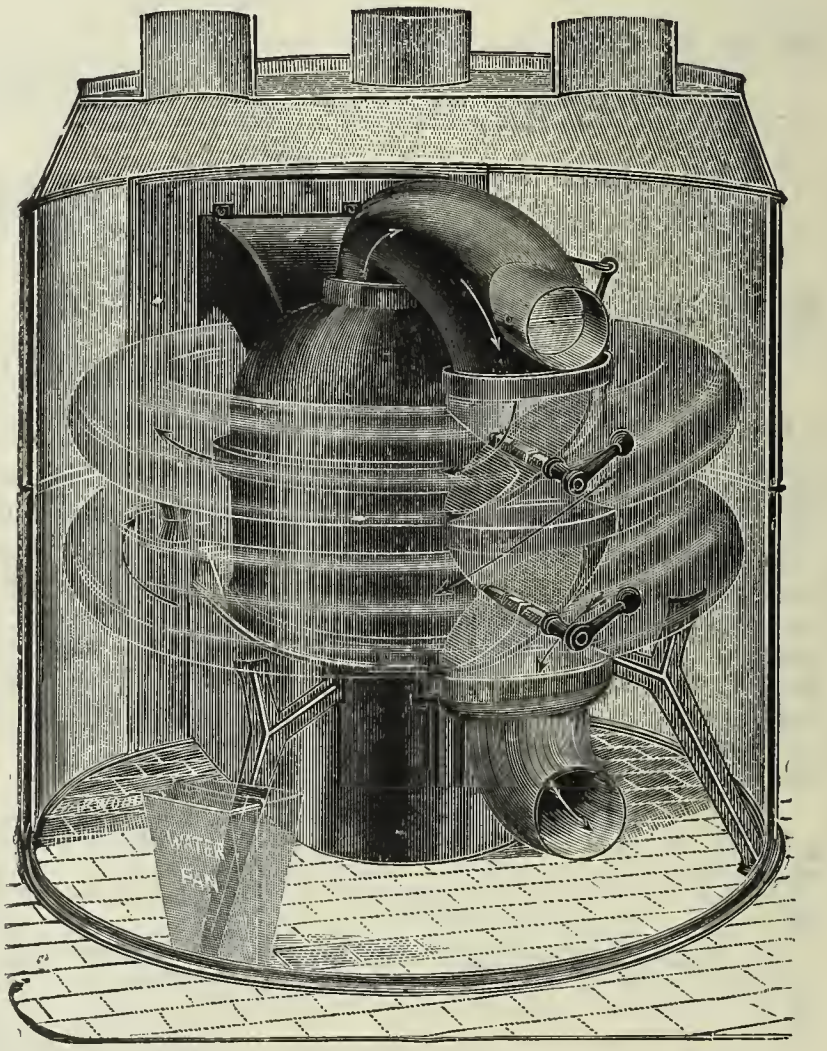
Economically.

The Down Draft Principle

which had never been successfully accomplished until the introduction of the

Howard Furnace

is now recognized by the public as a feature, simple and novel in construction, possessing remarkable heating power, and as utilizing to the utmost the heat-producing qualities of fuel.



The Howard

retains the heat generated by the coal for a longer duration of time and extent of space than any other furnace manufactured.

THE MAKERS

HOWARD FURNACE CO.,

NEW YORK. Syracuse, N. Y. BOSTON.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 9, 1897.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

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ST. LOUIS.....Commercial Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon Street, London, England

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The Business Situation.

Trade conditions, as a whole, continue satisfactory. In some wholesale lines a diminishing volume of business is reported after the recent activity, buyers having anticipated their requirements to a greater extent than for a long time past. Reports from the retail trade in nearly all sections, however, indicate sustained activity. The most important exception is in the quarantined districts of the South, where trade is almost at a standstill. The drought in the West, too, has proved somewhat of an unfavorable factor, imposing a check on the demand for certain classes of goods, and the mild weather which has generally prevailed delays orders for articles of winter use. Nevertheless, the aggregate volume of business, as reflected in the returns of bank clearings, is shown to be much beyond that of recent years. Last week's returns of clearings from all the leading cities of the country were 27 per cent. larger than a year ago, and 3.5 greater than for the corresponding week of 1892. September's aggregate clearings made the largest total for any month since January, 1893—namely, $5,521,933,332, an increase of nearly 15 per cent. over the previous month and of more than 50 per cent. as compared with September, 1896. The record of recent commercial failures, too, furnishes striking testimony to the improvement in business. According to *Dun's Review*, failures during the third quarter of the current year were only $28,963,000 in liabilities, the smallest total of any quarter for five years. Only six quarters in 15 years have shown smaller liabilities, while the average of liabilities per failure was the lowest in any quarter for 23 years. Railway earnings, exports of grain, cotton and manufactured products, and practically all the factors which influence the commercial world, remain favorable. The heavy volume of exports, combined with a sharp revival of buying interest in American securities abroad, have operated to bring foreign exchange down again to a level which indicates the early resumption of gold shipments to this country. Money rates are stiffening, owing to the active demand for funds for crop moving and industrial purposes. Commercial paper is in better demand, more city banks having come into the market as buyers, while the supply of good material is increasing. Heavy inquiries are noted in iron and steel lines, and the mills are forced to decline to enter contracts in many cases on account of the full condition of their order books. No very noteworthy changes in prices are recorded for the week, but such as occurred were generally in an upward direction.

The Price of Gas.

Hearings which are now being given by the City Council of Philadelphia to representatives of companies desirous of contracting for the lease of the municipal gas works, have elicited some interesting information in regard to the price at which gas can be supplied to private parties in cities similarly circumstanced to Philadelphia. One concern, the Philadelphia Gas Company, who will guarantee to the city an annual rental beginning at $1,000,000 a year, state that they would be prepared to furnish gas to consumers beginning at about 83 cents per 1000 feet and gradually reducing the cost from that figure. If the city's rental came off this figure, the company's representative states that consumers could have gas at 50 cents per 1000 and less. This company would supply water gas exclusively. Another concern propose to take charge of and conduct the city gas works at a uniform rate of 85 cents per 1000 feet for 30 years, giving 10 cents per 1000 feet as rental to the city. From these statements it seems clear that in the majority of cities the community is paying a price for gas out of all proportion to the cost of manufacture. It is generally conceded that recent improvements in gas making machinery have largely reduced the cost of production and swelled the profits accruing to the gas companies.

The Indiana Labor Commission.

The State Labor Commission of Indiana have been remarkably successful in settling strikes in some of the great industries of that commonwealth. The coal strike was of course a specially complicated question, as it extended over several States, and no discredit attaches to the failure of local arbitration boards to effect a settlement. In other cases, however, which were quite important to a number of communities, the commission won laurels by their ability to bring the warring interests together and securing harmony. It is naturally easier to adjust a labor trouble when times are improving and prices are stiffening than when values are drooping and employers are compelled to use the most rigid economy, but honor should be given wherever it is due, and the Indiana commission are certainly entitled to praise for what they have done. Other State boards of labor or of arbitration should be equally alert and efficient.

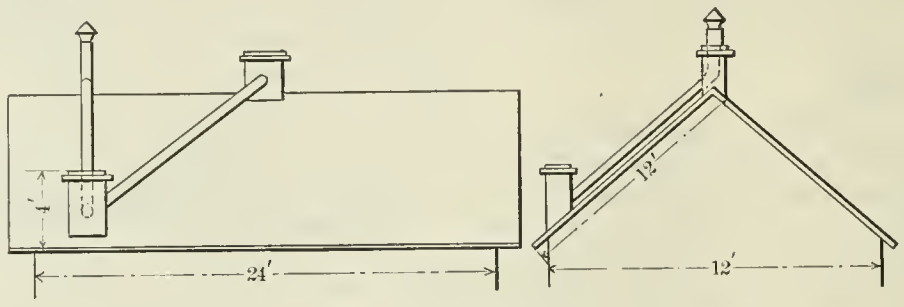
Major Handy, Commissioner-General of the United States to the Paris Exposition of 1900, who has begun his labors at the French capital, advises Americans who wish to make exhibits there to secure their space without delay. The total room allotted to this country is limited and there is no chance of obtaining more. So intending exhibitors should lose no time in putting in their applications.

E. C. Hegeler of the Matthiessen & Hegeler Zinc Company, La Salle, Ill., returned from Europe on the 29th ult., after a six months' sojourn on account of his health. His fellow townsmen gave him a public reception on his return as an evidence of their esteem.

THE LETTER BOX.

Wants Help with a Poor Draft.

From W. W., Bridgeville, Del.—Will *The Metal Worker* kindly tell me which will be the best way to secure a steady draft to a chimney that is on the southeast corner of a roof and extends about 4 feet above the eave? The house has two gables, one north and one south. When the wind is blowing from the east the chimney will not draw effectively and the rooms are filled with gas. The house is heated with hot water. My first plan is to run the galvanized iron pipe 6 inches from the roof, with the same slant as the roof, to the ridge, where it would be finished with a chimney top. A second plan is to run the pipe 6 inches from the roof to another chimney that is in the middle of the ridge, about half way from each end of the roof, and connect the pipe with it. A third plan is to extend the chimney straight up with bricks above the hight of the ridge. This plan, however, has the objection that it is likely to be blown down. If either of the first two plans is favored, what gauge of iron would be best to use? A sketch of the roof with the location of the chimneys is presented herewith in order that my case may be more readily understood.

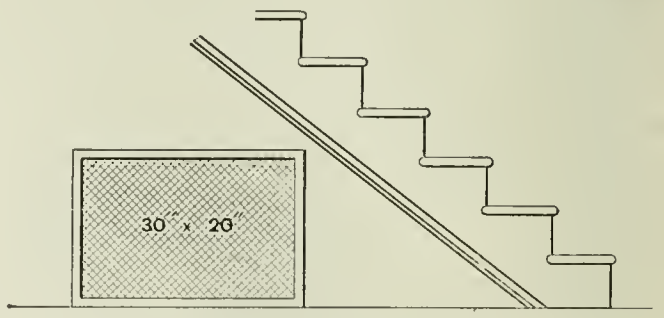


Wants Help with a Poor Draft.

Note.—As has been previously stated in *The Metal Worker*, the chimney problem is one entirely too perplexing for us to solve, and we invite the assistance of the readers of the Letter Box, and would refer our correspondent to the answer given under the head of "A Chimney Difficulty" in *The Metal Worker* of September 25, 1897. Of the three plans the best is to extend the chimney full size up to a point where the wind blowing over the roof will have no bad effect upon it, and to stay the chimney with such iron braces as will prevent any possibility of it blowing away. Improvement might be reasonably expected from carrying a sheet iron pipe up to the ridge of the roof and finishing with a chinmey cap, but the pipe should be double, otherwise the smoke in transit might become so chilled as to be sluggish in movement and defeat the desired end. It is stated that the chimney is used for a hot water heater, and knowing that ordinarily the construction of these heaters is such as to effect an indirect draft, the manufacturers of them generally state that they require a larger chimney than is found in the ordinary house, and as our correspondent does not state the size of the chimney, it is possible it may be too small. There is no doubt that correspondence with the manufacturers of the heater will determine whether or not the boiler in use requires a larger chimney than the one to which it is now connected. If the heater is to be connected with the chimney at the center of the roof better results will be derived if the connection be made in the cellar than by means of a pipe running across the roof on the outside.

Side Wall for Hall Cold Air Register.

From Anti-Friction, Owego, N. Y.—In answer to the inquiries of "Heating," in *The Metal Worker*, September 25, I have seen jobs where the cold air face in the hall to supply the furnace was placed in the side wall and everything worked finely. There is one thing that must be borne in mind, and that is the difference in the weight of air is less to operate the job than where the air is taken from out of doors; consequently everything must be done to lessen the friction of the air currents. The cold air face must be of ample capacity to pass the necessary amount of air to supply the furnace. More important yet is the size and shape of the cold air connection all the way from the face to the furnace. An ordinary partition stack will by no means answer the purpose. The pipe or box must be square, or nearly so; not a shallow wide one. I have seen the space under a stairs used for this purpose, as shown by Fig. 1, which shows a front elevation, and Fig. 2, which shows a side elevation of a connection for a 40 inch portable furnace supplying two 8, two 9 and two 10 inch hot air pipes. It will be found on calculating that the cold air supply is slightly in excess of the hot air supply, which is as it should be when the air is taken from house. A balanced damper was placed in the vertical pipe so that when the air supply from out of doors was used it could not blow up the house supply pipe and cool the house. This method avoids cutting the carpet



Side Wall for Hall Cold Air Register —Fig. 1.—Showing Register Connected to Box Under Stairs.

and prevents sweepings or other light matter being carried down into the furnace to be turned into "incense," as one might infer from the words used when it is seen to arise. When no stairs are handy for use a hall bench or seat or some other device must be supplied to give the connection at the face the proper size and shape.

Those who have had the most experience in ventilating know that air does not flow out of the average vent stack as it does out of doors or windows, and where there is so little inducement as is provided in a partition vent flue I

doubt if such a system would work very well without an exhaust fan in the attic. But being a firm advocate of providing a pure atmosphere in the home, I think the system proposed, with some additions, would be of enough benefit to more than repay the cost. I have seen a ventilator used on the top of a building connected with the

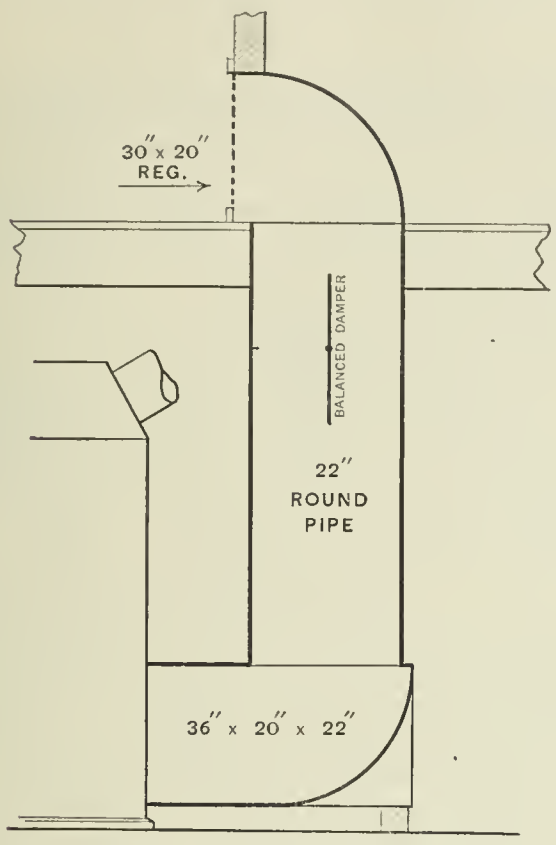
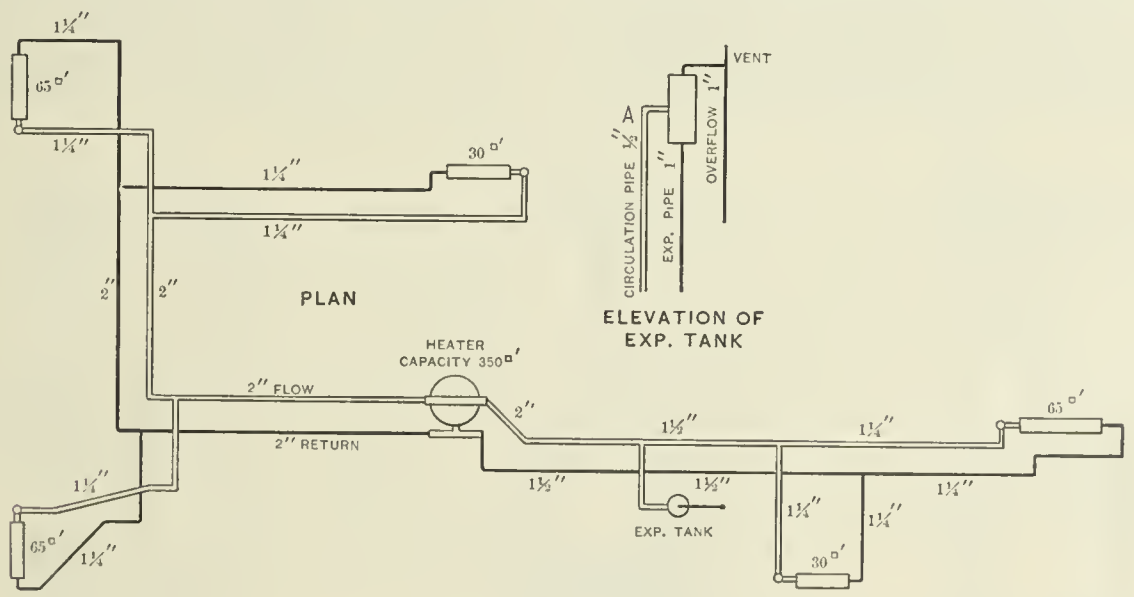


Fig. 2.—Side Elevation, Showing Pipe to Furnace.

vent ducts to exhaust the air from a building. On page 32 of *The Metal Worker* of June 5, this year, in the description of the ventilation of a fine residence, it is stated that a ventilator is used for this purpose. If my friend "Heating" will connect his vent stacks with some such a ventilator he will avoid any risk of having a cold attic. If it fails to work when the wind is not blowing, and his customer considers ventilation worth paying for, let him heat the receiving shaft with an atmospheric gas burner arranged properly for the work.

Is the Job Planned Correctly?

From A. F., Troy, N. Y.—I would be pleased to learn if the inclosed plan of a hot water heating system of the open tank pattern which I wish to put in my house is correct. I have the boiler and radiators and want to find out if I pipe it as shown will it work all right. Are the pipes too large, and, if so, why, and what sizes would you suggest in their place? I intend to take all the branches out of the top of the main. The radiators are all on the floor above the heater.



Is the Job Planned Correctly?

Answer.—There is nothing shown in the proposed system that would prevent its successful operation. In putting up the piping a liberal pitch should be provided, so that any air which may enter the system may also readily find an exit through the air valves that will be needed on the radiators. The size of the flow main and the return main must be the same wherever branches are connected for radiators, otherwise the circulation will be impeded. The tables used in the trade for mains give a 1½-inch main as having capacity for supplying from 90 to 140 feet of radiation and a 2-inch main from 140 to 200 feet, depending on the length, the exposure of the mains and the friction due to bends. From this it will be seen that the 2-inch main running to the left is ample and that a 1½-inch main might be used to supply the radiators at the right. There are no objections, but rather some advantages to be gained from the use of large mains where there is ample heating capacity in the boiler. If the expansion tank is in an exposed place the running of the ½-inch pipe A from a convenient point on the flow main and connecting it below the water line in the expansion tank will keep up the circulation and prevent freezing. If the expansion tank is placed where a pipe may be run up from it outside of the building an elbow should be put at the top of the tank and the pipe run up from a T placed for the overflow pipe. By piping in this way the elbow will prevent water being forced directly upward should steam be generated in the boiler by excessive firing. These suggestions, however, are not essential for success, and the job as planned will circulate if the work is properly done.

The International Cooling Company, 32 Pine street, New York City, are about completing a central refrigerating plant on Washington street, New York City, near the Gansevoort Market. The plant will have sufficient refrigerating capacity to supply not only the requirements of the market, but also a number of buildings in the vicinity in which cold storage is a feature. The idea of the company is to extend from this central plant street mains so that connections can be made the same as with the mains for water and gas, and restaurants, hotels, groceries and others needing refrigeration may install such apparatus as may be needed in their buildings to supply them from the street mains. The company have systems of a similar nature working in Denver, Col.; St. Louis, Mo., and a very efficient system at Atlantic City, N. J., where all the cooling in a number of the large hotels is done by means of their system.

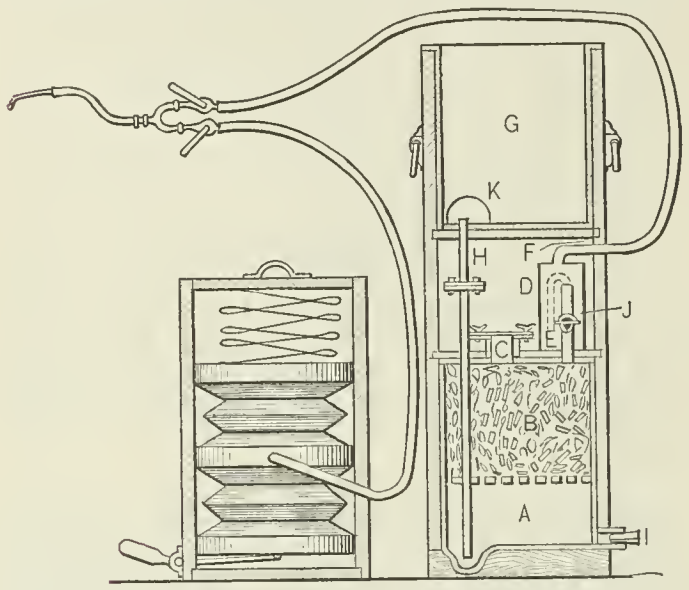
The American Tube & Iron Company have notified the employees at their works at Youngstown, Ohio, of a general increase of 10 per cent. in wages, to take effect on October 26.

The plant of the California Brass Works, San Francisco, Cal., was damaged by fire recently to the extent of $10,000.

HEATING AND PLUMBING.

LEAD BURNING MACHINES.

The mystery that formerly existed in reference to lead burning and the apparatus for doing the work has been almost entirely removed, and *The Metal Worker* has contributed not a little to this end by the various articles and illustrations it has printed in the past. There remains the mystery of the art of burning the seams in various



Lead Burning Machines.—Fig. 1.—*Machine Composed of Generator and Bellows*

positions, and this can only be conquered by practice. All that is needed for practice is the machine properly equipped and charged, a shave hook and some sheet lead, the heavier the better for a beginner. The lead to be joined must be cleaned—not nearly clean, but absolutely clean, for every little speck of dirt hinders a good connection. Then the flame from the burner tip must be applied with a circular movement, covering a circle ½ inch in diameter, and as the lead melts the flame should be moved in a way to push the molten drop where it is wanted.

Various styles of machine are used for the work, and we have reproduced here from the *Plumber and Decorator* of London the sketches and descriptions sent by two competitors in answer to the fourth of a series of prize questions covering the plumbing trade. The question was:

"Sketch in section the best kind of plumbers' lead burning machine that you know of, and describe how to charge it for use."

The answer given by R. Kieley is as follows, and refers to the machine shown in Fig. 1:

"To describe the machine: A is a small space covered with a false bottom, made of a piece of perforated sheet lead, and supported on pieces of pipe. B is a chamber, usually filled with scrap zinc or small bars of spelter. The zinc is put into the chamber B through the small manhole C, and rests on the perforated lead bottom. D is a pipe from the top of the gas generating chamber leading into the wash bottle E, and F is a pipe from the bottle E, to which is connected the india rubber tubing for conveying the gas to the burner. G is the acid chamber and H a pipe to convey the dilute acid down to the bottom of the well in the gas generating chamber. I is a small pipe for emptying the machine when out of use. The wash bottle E is also intended to cut off direct communication between the generating chamber and the flame. J is a stop cock for turning off the gas.

To charge the machine put about 7 pounds of zinc clippings into chamber B, 3 quarts of water and 1½ pints of sulphuric acid into chamber G; a pint of acid is added about every two hours. The zinc lasts about eight or ten days. The saturated acid should be drawn off each time after using.

"For neat burning we must pay attention to the bellows, as the air should be driven at a moderate and equal speed. A good test to indicate if the mixture and force of the current be duly regulated is to apply the hottest and most reductive point of the interior flame to a piece of shaved lead; the heated point becomes immediately as bright as silver, and the flame itself assumes a violet tint, produced by the volatilization of a small portion of the lead. When there is too much or too little air the heat is not so intense or pointed and the melting spreads over a larger surface owing to its being heated more slowly.

"K, in the acid chamber, is a heavy perforated lead cap to break the violence of the escaping gas."

The answer sent by another competitor, whose name was not given, includes sketches of three different ma-

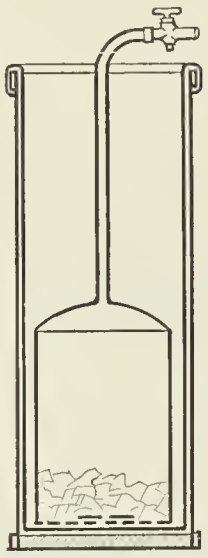


Fig 2.

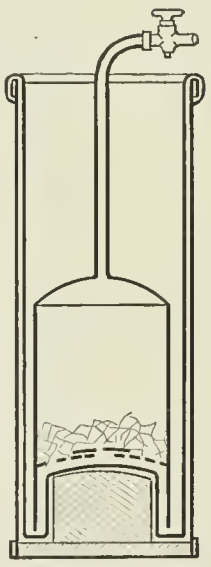


Fig. 3.

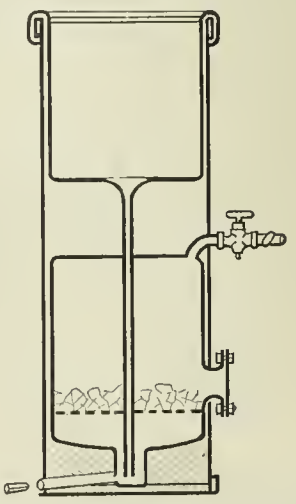


Fig. 4.

Three Styles of Machine.

chines, and their construction and use are described as follows:

"Figs. 2, 3 and 4 are sketches of three kinds of lead fusing machines or hydrogen generators.

"Fig. 2 is the simplest in construction and is much used in chemical works. It consists of an outer case of wood or sheet iron, lined with 4 or 5 pound sheet lead, and an inner vessel called an "ometer," made of lead with a perforated bottom and a pipe leading from top with a tap on end for connecting to rubber tube. Zinc spelter is placed inside the ometer (sufficient to cover the bottom) through a hole left in the bottom, which is afterward closed with a small piece of sheet lead laid loosely over the hole inside.

"Water is then poured into the case until it becomes nearly three parts full, then rectified vitriol (free from arsenic) is poured in, in proportion about 1 part to 8 parts of water (according to the strength of the acid).

"The tap should now be opened to let out the air contained in the ometer, when the dilute acid will flow into the ometer and come into contact with the spelter.

"If there is sufficient acid, gas will now be given off into the ometer and the dilute acid will be forced back into the outer case. If this does not take place more acid will be required. If the acid rises rapidly and the gas comes bubbling through, it will be better to add more water, which is soon learnt by experience.

"The chief objection to this make of machine is on account of it continuing to make gas after all the acid has been forced out of the ometer, owing to the spelter lying on the bottom aud always being in contact with the acid. It is therefore very wasteful unless the ometer is lifted out of the acid every time the gas is not being used.

"Fig. 4 is designed to obviate the waste of gas without the necessity of altering any part of the apparatus.

"In this case the spelter is introduced through the hole on the side, which has afterward to be made gas and acid tight; the acid and water is then poured into the top chamber, whence it flows down the pipe, on letting out the air from lower chamber, and comes in contact with the spelter; thus the gas is generated, and, if the tap be closed, will fill the lower chamber, driving the acid back up the pipe into the top chamber, until the acid is below the level of the spelter, and thus no more gas is generated until the tap is opened and the gas used. Thus none is wasted, and this constitutes the chief advantage of this machine over the previous one described.

"The great objection to this, however, is the difficulty of cleaning it out and charging with spelter; also the liability for the pipe to become blocked with crystals of zinc sulphate, which necessitates the dissolving out with hot water.

"In order to combine the simplicity of the former with the economy of the latter, I designed, and have used for some time, a machine as shown in Fig. 3, and find it answer admirably, the difference between this and the first described being in the trapped portion at the bottom of the ometer, which has the effect of leaving the spelter clear of the acid when the ometer is full of gas, thus not generating and wasting gas when not in actual use.

"It is also very easily charged and cleaned by lifting the ometer out of the case and laying it on its side upon the bench; there is no small pipe to become blocked by crystals and no joints to be made good every time it requires spelter. It is also much less costly in the first instance than Fig. 4."

A Rule for Chimney Capacity.

There is an old rule of thumb for chimneys, says the *Boiler Maker*, assigning 1 square foot of grate per horse-power of the boiler, and from one-tenth to one-eighth the area of the grate for the area of the chimney, varying the hight to make up for required draft. A more definite system of computing chimney power is in use by engineers, by which the quantity of coal to be consumed on the grate per hour and per square foot, with an allowance for the friction of the gases in the chimney, form the basis of the formulas for size and hight of a chimney. A formula based on a consumption of 5 pounds of coal per square foot of grate per hour is much used, in which the horse-power required and an assumed hight of chimney are factors. Then

$$\frac{\text{Horse power}}{3.33 \times \sqrt{\text{height}}} = \text{effective area},$$

which must be increased by its square root × 0.8 for the actual area to allow for friction. In this way valuable tables of sizes and hights of chimneys for any horse-power and for both brick and iron chimneys of round and square form have been made.

Plumbing in Australia.

A writer in an Australian paper announces that the Melbourne Board of Works have ordered owners of property iu certain localities to conform to the new regulations in reference to house draiuage, and he gives the following in reference to the details of the present system :

Polluted wastes are discharged into the nearest surface drains and excrementitious matter is stored in earth pans and removed periodically. Thus the surface drains are always carrying foul water, and it is necessary to employ a considerable number of men to keep them clean. The operation of sweeping, more especially iu the suburbs, is very offensive, and the methods of removing the sweepings unduly insanitary. In the center of the city these conditions are somewhat mitigated by the coustruction of underground drains. The article then treats of their new sewer system as applied to house drainage, which is very similar to the plumbing regulations of the up to date American cities. It requires that the work shall be done by a licensed workman who has shown his proficiency before an examining board. Plans must be filed with the proper official when a permit is applied for to do the work. The existing plumbing in a piece of property where work is to be done must be approved by an inspector before the new work can be commenced. The regulations provide that traps shall be ventilated, and that intercepting traps shall be used betweeu the house and the sewer. The new regulations are evidently a great advance over the method heretofore followed in Melbourne for the disposal of household waste.

The Plumber and the Heating Contractor.

BY ONE OF EACH.

In a discussion between a number of tradesmen, some who did only heating, some plumbing alone, while others did both kinds of work, the question was asked why it was that the heating contractor had to meet but very few legal requirements, but was held to much stricter account for his work by his customers than the plumber. To the disgust of the plumber, one heating contractor claimed that the heating contractor had to be a more intelligent man than the plumber because of the nature of his work. The discussion was fast taking the form of an argument when one man who did both kinds of work ventured to state that if a plumber and a heatiug coutractor were to do work of about the same cost in a building, and if the plumber's work was badly done it would probably remain undiscovered for a long time, and cost the plumber nothing, while if the heating contractor's work was badly done the first few days of winter would demonstrate this, and the deficiency would have to be made good, and in many instances a portion of the purchase money would be held until a weather test was made of the work.

A little reflection on the part of those present brought forth the agreement among the plumbers that a most rascally job could be done where there were no stringent regulations and inspection was not required, and the owner remain ignorant of it until some dire calamity had visited him to bring it to his notice, and then, in all probability, there would be no redress, and the owner would have to bear the expense of remodeling as well. Those present who had done heating work testified to the uniform practice in their trade to guarantee to provide a given temperature under specified conditions, and the business reputation and responsibility of the house were involved before a contract was placed in many instances, so that the buyer might be sure that any defect that might

be discovered would be made good. A slight error in judgment in some detail might necessitate a considerable expense in a heating plant to make it right, while a vent pipe could be run into a partition and stop there instead of being carried to the roof, and other similar pieces of rascality in the plumbing line might pass unnoticed for years.

The custom of the public has been to hire any man who hung out a sign as a plumber, providing his price was low, the only restriction being that their property should not be deluged with water, which seemed to be the only guide as to efficiency. The movement on the part of good plumbers and the health officials to set up other standards of efficiency is, however, rapidly overcoming this evil. The heating man, on the other hand, while meeting just as sharp competition from low prices, is forced for self preservation to understand his business well enough to know in advance the amount of heating the plant he provides will do, for in the event of failure he must at his own expense supply whatever is necessary for success. If this does not require the heating contractor to be more intelligent, as was inferred, it certainly makes him more careful, for while people may be careless of their health they are very exacting in what affects their comfort.

Gas Engine Water Heating System.

Through the courtesy of the *American Gas Light Journal* we are enabled to present a sketch and the following description of a novel heating system :

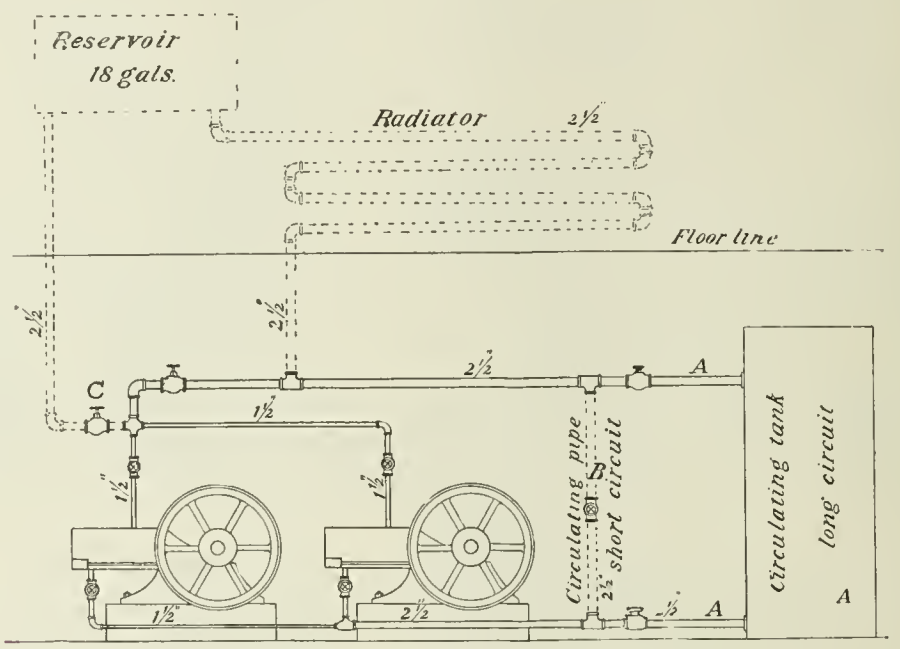
A gentleman prominent in the management of the Grand Rapids (Mich.) Gas Light Company, writing under date of September 22, says that Mr. William Widdicomb, a resident of Grand Rapids, and a prominent gas consumer, has successfully used the heated water from a gas engine water jacket to warm the corridor of his office building. He uses two 13 horse-power gas engines to pump water for elevator service. The water jackets of these engines were cooled by the usual method of tank circulation, as shown by the continuous lines in the accompanying sketch. The system was extended, as shown by dotted lines, the hot water being carried first to a small reservoir at the highest point in the system, thence descending through a series of hot water radiators back to the basement.

The dotted pipe B was placed to secure a more direct circulation than was had through the tank, and suitable shut offs were placed to change the course of the water through the short circuit B, in cold weather, or the long circuit A, in warmer weather, the circulation during the summer months, through reservoir and radiators, being entirely cut off by means of the valve C.

Mr. Widdicomb has also arranged to supply hot water for the barber shop on the second floor of the building by passing the gas engine exhaust pipe lengthwise through an ordinary 30-gallon kitchen circulating boiler, located in basement with engine. The heated water was carried up to shop by piping, ending with the usual tap. Water is thus constantly supplied at almost boiling point in the barber shop.

Pittsburgh's Public Bath House.

The public bath house that is being erected at the corner of Penn avenue and Sixteenth street, Pittsburgh, will be completed and opened to the public about November 1. The structure, with its completed arrangements, is the gift of Mrs. William Shaw, Jr. The building is fire proof throughout, the only wood used in its construction being the door and the interior of the waiting room. The bath house proper, which runs back along Sixteenth street, is only one story high. It has two apartments, each containing 12 bathrooms, 11 for shower baths and one with a tub. The partitions are all highly polished marble slabs. Each bathroom has a furnished dressing room in connection. This bath house is being erected under the direction of the Bath Committee of the Civic Club, of which Dr. Thomas Turnbull of Allegheny is chairman. It is especially intended for the working people who have no means of bathing in their homes or elsewhere. The nominal low sum of 5 cents will be charged for the use of a bathroom, thus bringing their use within the means and reach of the poorest people. Dr. Turnbull states that if profits will be made at this rate the price will be reduced to 4 or probably 3 cents for the use of each bathroom. The only object for charging admission is to defray the operating expenses. The building will probably be open from 7 a.m. to 9 p.m.



Gas Engine Water Heating System.

Powell's Plumbers' Brass Goods.

We have received from the William Powell Company, Cincinnati, Ohio, their new catalogue No. 6, devoted to plumbers' brass goods. The catalogue consists of 126 pages, bound in a salmon colored cover, with the words "Powell's Plumbers' Brass Goods" in embossed red letters on the front cover. The first inside page is printed in red, and the reader is asked to notice that they manufacture a line of high grade steam goods. The next page shows a bird's eye view of the plant of the company. The first three pages are devoted to the Star bath. sink and basin plugs, followed by 30 pages devoted to polished and rough stops and wastes for a variety of purposes. Powell's compression bibs, basin cocks and bath cocks occupy 30 pages, when a variety of Fuller bibs of improved pattern for all purposes occupy 30 more pages, and the balance of the catalogue is occupied by self closing goods and the smaller specialties which the plumber finds indispensable in his work.

The Patten Mfg. Company have been incorporated at Chattanooga, Tenn., by W. R. Patten and George E. Jamme, for the manufacture of High Grade Plumbers' Cabinet Ware.

New Plumbing Ordinance Proposed for Chicago.

At a regular meeting of the Chicago City Council, held September 27, Arthur R. Reynolds, M.D., Commissioner of Health, presented a communication calling attention to the act taking effect July 1, 1897, providing for the examination of plumbers and the supervision of plumbing work. Commissioner Reynolds goes on to say that after consultation with the counsel to the corporation and with representative plumbers he has prepared the draft of an ordinance which he submits for the consideration of the City Council. The following is a copy of the proposed ordinance :

AN ORDINANCE

To provide for the examination and certification of plumbers.

Be it ordained by the City Council of the City of Chicago:

SECTION 1. That any person now or hereafter engaging in or working at, or representing himself to be engaged in or working at, the business of plumbing in the city of Chicago, either as master plumber or employing plumber, or as a journeyman plumber, shall first obtain a certificate therefor, as hereinafter provided.

SEC. 2. Any person desiring to engage in or work at the business of plumbing, either as a master plumber or employing plumber, or as a journeyman plumber, shall make application to the Board of Examiners hereinafter provided for, and shall, at such time and place as said Board may designate, undergo such examination as to his qualifications as said Board may direct. Said examination may be made in whole or in part in writing, and shall be of a practical and elementary character, but sufficiently strict to test the qualifications of the applicant.

SEC. 3. There is hereby created a Board of Examiners of Plumbers, consisting of three members, one of whom shall be the Commissioner of Health, who shall be (*ex-officio*) chairman of the said Board of Examiners ; a second member who shall be a master plumber and a third member who shall be a journeyman plumber. Said second and third members shall be appointed by the Mayor, by and with the advice and consent of the City Council, on the first Monday following the approval of this ordinance, or as soon thereafter as may be, and the said two members so appointed shall hold office until the first Monday in May, 1898, and thereafter the second and third members to be appointed on the said Board of Examiners shall be appointed by the Mayor, by and with the advice and consent of the Council, annually, on the first Monday of May in each year, and shall hold their office for the term of one year and until their successors are appointed and have qualified. The salary of each of the said second and third members of the said Board shall be $1000 per year.

SEC. 4. Upon the passage of this ordinance the Mayor shall appoint, by and with the advice and consent of the City Council, a secretary to said Board of Examiners, whose duty it shall be to preserve and keep all books and papers belonging to said Board, or which are required by law to be filed with said Board, and to do and perform such other services as may be required by the said Board of Examiners. The person first appointed shall be appointed by the Mayor, by and with the advice and consent of the City Council, on the first Monday following the approval of this ordinance, or as soon thereafter as may be, and shall hold his office until the first Monday in May, 1899, and thereafter the secretary to said Board of Examiners shall be appointed on the first Monday in May, 1899, and biennially thereafter. The salary of the said secretary shall be $1200 per year.

SEC. 5. Said Board of Examiners shall, as soon as may be after appointment, meet at such time and place as the Commissioner of Health may designate, and proceed to carry out the provisions of this ordinance. Said Board shall examine applicants as to their practical knowledge of plumbing, house drainage and plumbing ventilation ; and if satisfied as to the competency of any such applicant, and upon receipt of the fee hereinafter provided, the Board shall issue a certificate to such applicant, authorizing him to engage in or work at the business of plumbing, whether as master plumber or employing plumber, or as journeyman plumber. The fee for the examination and certificate of a master plumber or employing plumber shall be $5 ; for a journeyman plumber it shall be $1. All fees received for said examinations and certificates shall be paid into the City Treasury.

SEC. 6. The Commissioner of Health is hereby authorized to provide office room for the secretary of said Board of Examiners, in the Department of Health ; and all records of the said Board shall be part of the records of the said Department of Health.

SEC. 7. During the current fiscal year, and until the next annual appropriation shall have been made, the moneys necessary to be expended for the payment of salaries of the members of the Examining Board and of the secretary of said Board, and all other necessary and legitimate expenses incurred in carrying out the provisions of this ordinance, shall be paid by the City Comptroller out of moneys not otherwise appropriated ; provided, however, the amount to be so paid shall not exceed the sum of $2500.

SEC. 8. The certificate herein prescribed for master plumbers shall be accepted in lieu of the examination provided for in Section 1417 of the Revised Code of Chicago, 1897, which section is hereby repealed in so far as it is inconsistent or in conflict with the provisions of this ordinance but all other existing ordinances and sections of ordinances relating to plumbers and plumbing shall continue to be operative and in force, unaffected by the passage of this ordinance.

SEC. 9. Any person violating, disobeying, neglecting or refusing to comply with any of the provisions of this ordinance, shall be subject, on conviction thereof, to a penalty of not less than $5 nor more than $50, and upon such conviction or upon conviction of violation of any rules and regulations based thereon, the certificate may be revoked by the Mayor, on recommendation of the Commissioner of Health.

SEC. 10. This ordinance shall take effect from and after its passage and due publication.

The Gorton Soft Coal Boiler.

That soft coal can be successfully burned in heating boilers is demonstrated in the experience of those who are using the Gorton soft coal boiler, made by the Gorton & Lidgerwood Company, 96 Liberty street, New York. Six years of constant use has shown that this boiler will burn successfully the cheapest unwashed coal obtainable, the finest slack and lump together, just as it comes from the mines, and the tubes above the fire do not choke or clog with soot, and require no cleaning.

The fire pot in the Gorton soft coal boiler is so constructed that sufficient additional air is drawn through the fingered ring, at the lower edge of the coking chambers, to ignite all the gases arising from the coking process. This gives perfect combustion and prevents the deposit of soot and unconsumed carbon on the heating surface of the boiler, and makes use of that part of the fuel which is wasted when soft coal is used in ordinary fire pots. The Gorton boiler is said to be the only boiler that will burn soft coal by coking it before it feeds down on the fire. In a recent letter received from a user of their soft coal boiler in Iowa is the following statement:

"I can burn the different grades of slack coal that I can get here, with less dirt and smoke than my neighbors who burn the best lump and nut coal. I heated my house of nine rooms last winter for $27 and some cents."

Similar experience is reported from others who have used the Gorton soft coal boiler—some for the past six years.

NOTES.

A meeting of the Wrought Iron Pipe and Tube Manufacturers' Association was held at Pittsburgh, September 30, at which a slight advance was made in prices. The particulars of this meeting will be found in our Trade Report this week.

J. H. E. Green, a plumber and gas fitter at 209 Pleasant street, Worcester, Mass., is putting in the machinery and material necessary to carry on a sheet metal business.

Elwood Wilson is enlarging his plumbing establishment at Lafayette, Ind.

G. W. Chamberlain and C. M. Hersey of Pittsfield, Maine, have recently purchased the stock and material necessary for a plumbing business. They also have a line of machinery which will enable them to do machine work.

P. J. Hartnett is moving his plumbing shop to 210 Washington street, Newton, Mass.

R. B. Morris and W. W. Otter have been appointed a committee by the Master Plumbers' Association of Houston, Texas, to urge the appointment of a board of plumbing examiners by the Mayor, in accordance with the law passed June 4, 1897.

P. J. Dullanty has been awarded the contract for plumbing the Miller Block, at Ashland, Wis.

George W. Briggs, Omaha, Neb., bid $4150 and was awarded the contract for a Steam Heating Plant for the Hawthorn School Building.

George N. Ainsworth, a well-known plumber of Athol, Mass., was stricken with apoplexy and died at his residence last week at the age of 48 years.

John W. Stewart of the firm of Silas & Stewart, 112 Worthington street, Springfield, Mass., died at his resi-

dence on Friday of last week, aged 58 years. He had been for a long time associated with the steam heating trade, and had once served as an engineer in the State Lunatic Asylum at Brattleboro, Vt. He was a member of several fraternal orders and is survived by a widow.

The Griffith Heating & Plumbing Supply Company of Spokane, Wash., having purchased and remodeled the Plants Building, at the corner of Railroad avenue and Howard street, have removed their entire stock of Plumbing and Steam Fitters' Supplies to their new quarters.

The Master Plumbers' Association of St. Paul, Minn., at a recent meeting passed the following resolution: "*Resolved*, That no master plumber engaged in business in the city of St. Paul shall employ any person working at the trade of plumbing other than those having obtained a certificate from the State Board of Plumbing Commissioners showing his qualification as a competent workman; and we respectfully ask property holders having plumbing work done to see that the plumber doing such work has a certificate of competency."

The firm of H. H. Wicke & Co., Pensacola, Fla., have dissolved by mutual consent, by the retirement of Mr. Wicke. The business will be continued by C. F. Zeek, who has associated with him C. R. Faulkner. The new firm will operate under the name of the Escambia Plumbing Company.

E. L. Jones & Co., Dover, Del., have secured the contract for heating the State House, at Dover, at their bid of $1550.

The Board of Health of Albany, N. Y., have purchased a smoke machine for testing drainage and plumbing systems.

The Plumbers' Examining Board of Hartford, Conn., are busily occupied with applicants for plumbers' licenses, as the law requires that no plumber can work without a certificate after October 1. Among the applicants were F. T. Matox of New York, J. E. Honnan of Brooklyn, N. Y.; George Easton of Westfield, Mass., and M. J. Harrington of Springfield.

A Chicago steam fitter has removed to Christiania, Norway, where he has engaged in business in his old line. He writes to the American Boiler Company relative to introducing their goods, believing that a fine opening exists for the use of American steam and hot water heating appliances. If he succeeds in getting these appliances adoped he will very probably stir things up considerably in that ancient country.

The Fuller-Warren Company, Milwaukee, Wis., are now in possession of a full consignment of patterns and machinery for making Fowler & Wolfe Radiators, having recently obtained the same from the Fowler & Wolfe Mfg. Company of The Bourse, Philadelphia, and have started manufacturing Radiators. The territory assigned to the new makers comprises the States of Michigan, Wisconsin, Illinois, Indiana and all the territory west of the Mississippi River, and they expect to be well able to take care of all orders in their field. The Fowler & Wolfe Company state that the demand for their Radiators is something phenomenal, a number of orders from all parts of the country being received every day, covering the best steam fitting trade in the country.

The E. J. Nolan Plumbing Company have been incorporated at Cincinnati, Ohio, with a capital stock of $5000.

B. E. McDermott has opened a plumbing shop in the Odd Fellows' Building, at North Cambridge, Mass.

Plumbing Inspector Albert S. Whitehead of Allegheny, Pa., testified against and secured the conviction of a plumber who had done work in violation of the health regulations.

The Farwell Heating Company, Atchison, Kan, are putting in one of their Farwell boilers in the Hetherington Building.

The following members of the Plumbers' Examining Board at Hamilton, Ohio, were unanimously reappointed on the expiration of their terms: John L. Walker, John P. Henn, Harry J. Thompson and Jacob Rieger.

The Thayer Heater Company, 32 Oliver street, Boston, Mass., have brought out in very pretty form a pamphlet of testimonial letters, all of which were written during the year 1897, and it is unnecessary to state they all speak in the highest terms of the Thayer heater.

The Alpha Combined Heating & Lighting Mfg. Company of New York City filed a certificate of incorporation at Albany, N. Y, October 6. The concern will manufacture devices for heating and lighting, and have a capital stock of $60,000. The directors are Asael Wells, William Murray, Isaac Mailhouse, Henry Lewis Jeffries and Loren S. Wells of New York City.

The R. S. Blackburn Plumbing Company of New York City have been incorporated at Albany, with a capital stock of $5000, the directors being Charles Blackburn, John Harrison and Thomas Blackburn of New York City.

The Burgess Soldering Furnace Company, Columbus, Ohio, issue a tasteful little illustrated circular and pricelist relating to their extended line of Burgess Gem Furnaces. This firm began the manufacture of Portable Gasoline Soldering Furnaces over a quarter of a century ago, and since then they have been continually improving their apparatus until now they have what they consider the perfection of a soldering furnace. The goods shown in the circular are Tinners' and Roofers' Furnace, Plumbers' and Tinners' Furnace, Tinners', Roofers' and Plumbers' Furnace, Canners' and Tinners' Furnace, Electricians', Plumbers' and Tinners' Furnace and the Gem Paint Burner.

The American Brass Works is the name of a new firm who will soon occupy the top floor of the large Chadborn-Coldwell Mfg. Company Building at Newburg, N. Y. The firm will manufacture special Brass Goods for the building trade, particularly sanitary fittings.

The Charles H. Crocker Company have been organized in Portland, Maine, for the purpose of manufacturing and dealing in Heating Apparatus of all kinds and doing a general business in Tin, Iron and Metal Work. The officers are: President, George H. Allen of Portland; treasurer, Charles H. Crocker of Deering.

Meeting of Black Sheet Makers.

(*By Telegraph.*)

A very fully attended meeting of the black sheet manufacturers of the United States was held in the Conestoga Building, Pittsburgh, on Thursday, October 7. The meeting was called for the purpose of considering the present condition of the sheet industry and to consider the advisability of making an advance in prices owing to a large advance in prices of billets and to the heavy demand for sheets. Out of 35 firms to whom notices of the meeting were sent, 31 were represented in person. N. E. Whitaker of Whitaker Iron Works, Wheeling, W. Va., was chairman, and John Jarrett, Pittsburgh, secretary. After a full discussion of the conditions governing the sheet industry at this time, the following was unanimously adopted:

"*Resolved*, First, that the basis of prices of the sheets be established on No. 28 hot finished steel sheets. Second, that the price on No. 28 hot finished steel sheets be fixed at $2.10 per 100 pounds, and for all steel sheets having one pass through cold rolls before or after annealing, the price shall be $2 15 per 100 pounds, f.o.b., maker's mill. Terms, 60 days' acceptance or cash, less 2 per cent., in ten days from date of shipment."

Prices for other gauges in addition to 28 were fixed as follows:

No. 30, $2.40; 29, $2.25; 28, $2.10; 27, $2.05; 25 and 26, $2.24; 23, $1.95; 22, $1.90; 19 and 20, $1.85.

The steamer "H. A. Root," which has been engaged for some time in raising the cargo of copper from the steamer "Pewabic," sunk off Alpena, in Lake Huron, 32 years ago, arrived at Milwaukee last week with 600 tons of copper recovered from the sunken weck. The "Pewabic" lies in 165 feet of water. A large amount of ingots and milled copper, which was taken out of the vessel, is said to be in perfect condition, the water appearing to have had no effect on the metal notwithstanding its long period of submersion.

The London *Standard* says that a new Russian syndicate, composed of 12 large petroleum companies, is forming to operate the Baku oil fields for a period of ten years from 1898.

The Peruvian Government is offering special advantages to the manufacturers of machinery in the United States in the permanent exposition of all kinds of machinery which is to be inaugurated in Lima on December 9 next. All exhibits will be admitted free of Custom House duties, as well as from consular fees. Full particulars regarding the exposition are obtainable from Carlos G. Estenos, acting Consul-General of Peru in New York City.

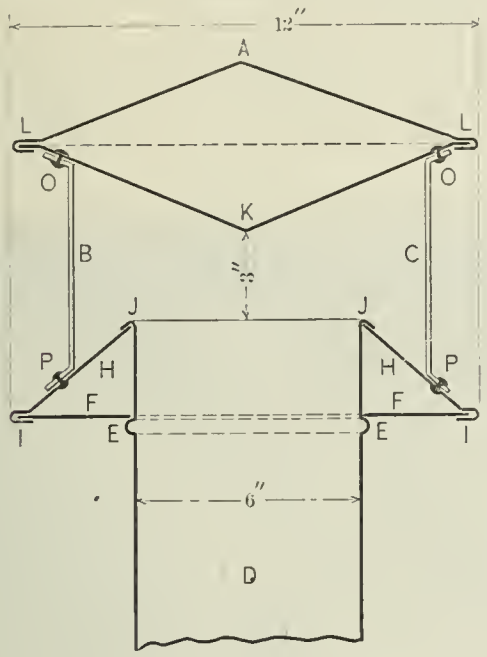
United States Minister Buchanan, at Buenos Ayres, has supplied the State Department at Washington with copies of decrees issued by the Argentine Government inviting proposals for the construction in Buenos Ayres of a central railway station to cost about $4,000,000. Bids from citizens of the United States will be invited through the Argentine Legation in Washington.

SHEET METAL WORK.

PATTERNS FOR AN EMERSON VENTILATOR.

BY W. N.

One of the many articles made in the tin shop by the sheet iron worker is an Emerson ventilator. The diagrams presented herewith show the method of drawing the ventilator in proper proportion, and the methods of



Patterns for an Emerson Ventilator.—Fig. 1.—*Sectional View.*

obtaining the patterns by the short rule. While the rule which will be presented will not be strictly accurate, it varies so little that it is applicable to any shop practice.

In Fig. 1 let A B C D represent a sectional view of the ventilator, giving dimensions and method of construction. When drawing the ventilator the rule used to proportion it is as follows: If the stack D is 6 inches, the hood and flaring piece H H, below, will be twice that amount, or 12 inches, as shown, while the distance from the apex of the deflector K to the top line of the stack J J will be one-half the diameter of the stack, or 3 inches. In the construction of the stack, E E is a bead made in the beading machine, on which the bottom of the ventilator rests, while H H is seamed to the bottom at J J, the stack being flanged over H H at J J. The hood A and deflector K are seamed together at L L, while the braces C and B are soldered, bolted or riveted at O O and P P. If the braces are bolted or riveted, then this must be done before seaming the various parts together.

In Fig. 2 are shown the shop rules for obtaining the patterns, one-half of the elevation only being required. For the pattern for the brace F bend off a piece of band iron of the required thickness, with flanges having holes punched into same to admit rivets or bolts at H and H, corresponding to angles at H and H. For the pattern for the stack obtain the circumference of the pipe and run a bead around the pipe at a distance equal to I O or J P from the end.

In laying out the drawing for hood and deflector, have the distance E A and E D equal, so that the pattern for one can be used for the other.

For the pattern for the hood proceed as follows: With A as center and A C as radius, describe the arc V U. Draw a line from A to V. Now set the dividers equal to E C, or half diameter, and, commencing at V, step off three spaces, shown by M M U. Draw a line from U to A. Then will U M M V be the half net pattern for hood and deflector. On the deflector pattern add a single seam, and on the hood pattern a double seam.

For the pattern for the flaring piece J L extend the line J L until it intersects the center line at W. With W as center, and W J and W L as radii, draw the arcs J J^1 and L X At any convenient point draw the line X^1 W, intersecting the inner arc at N. Set the dividers equal to I J or O P, or half diameter, and, commencing at N, step off three spaces, shown by N^1 N^1 J^1. Draw a line from W to J^1, extending it, cutting the outer arc at X. Then will X X^1 N J^1 be one-half the net pattern for flaring piece I J L O. Allow for double seam along the arc X X^1, as required at L. For the pattern for the bottom

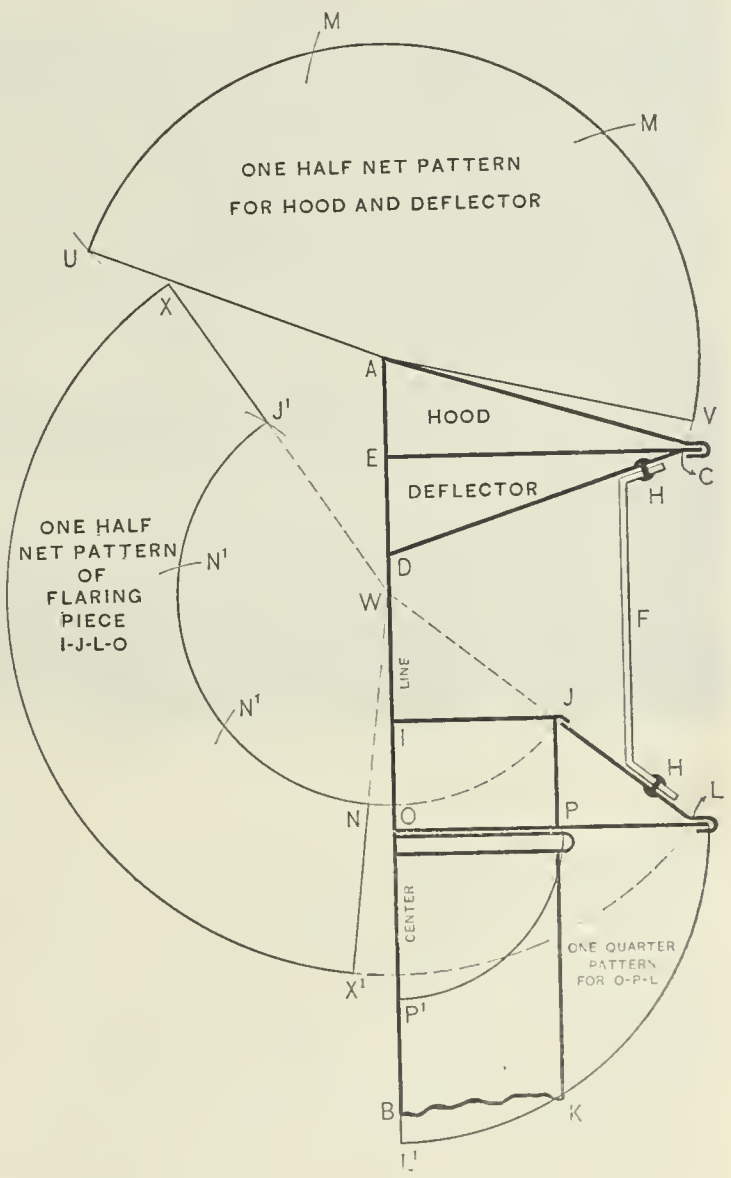


Fig. 2.—*Shop Rules for Obtaining the Patterns.*

P L take O as center and O P and O L as radii and describe the arcs P P^1 and L L^1, intersecting the center line A B extended at P^1 and L^1. Then will P P^1 and L L^1 be one quarter of the pattern for bottom O P L.

The Illinois Steel Company will not again operate the Sheet mill at Hammond, Ind., which they leased some time since from the Corning Steel Company. They are tearing down the galvanizing plant which they erected there and will remove it either to South Chicago or Milwaukee. It is not known whether the Corning Steel Company will operate the plant, but it will most likely stand for some time.

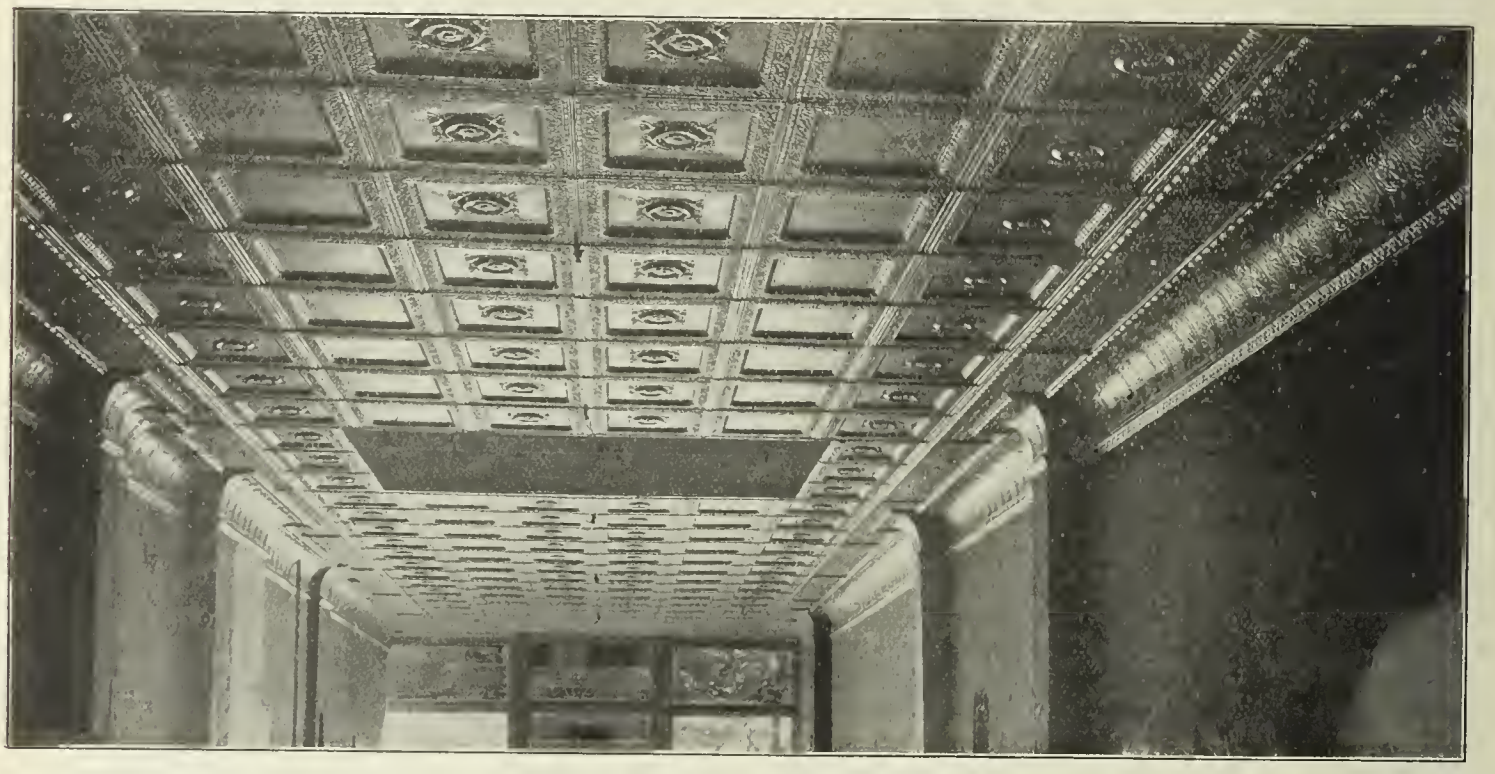
Modern Tinsmithing.

A visit to the shop of F. S. Burrows, whose office is at 107 Beekman street, New York City, discovers a variety of sheet metal productions that could only be turned out in what may be truly called a modern tin shop. In former days the tinsmith was kept busy in making articles that are now produced in the large factories by the stamping process. The tinsmith, however, has not been entirely suppplanted by machinery, and the services of the expert workman are still in demand for making various specialties which often are not produced in sufficient numbers to warrant the expense of the costly machinery that would be necessary for their production by power.

In the shop of Mr. Burrows is found a collection of small machines adapted for various special requirements with such machinery of heavier character as can be readily operated by hand power. Having devoted his time to the manufacture of specialties, his business is largely the making of patented articles of peculiar construction which require perfect fitting and neat workmanship, such as was the pride of the old time tinsmith. Among the examples of fine work which have been turned out in this shop are what is known as a bug gun for killing insects, a washing machine which is a credit to the shop in the character of the workmanship it displays, and one of the latest productions is a machine for washing "pay dirt," designed for use in the placer gold bearing districts. This machine is designed to separate the gold from the dirt, and much larger quantities of dirt can be washed by one man in less time than can be done by hand washing. In the construction of the troughs, which are designed to catch the precious metal as it is carried along the sluiceway of the machine, a uniformity of workmanship is shown that could not be surpassed if they were manufactured by machinery. In the production of these specialties the ingenuity of the tinsmith is often taxed, and templates, disks and peculiar looking tools and parts may be seen throughout the shop.

Fine Example of Sheet Metal Ceiling Work.

By means of the half-tone engraving presented herewith we show the interior of a restaurant at 2605 Olive street, St. Louis, Mo., which is finished with a very handsome pattern of sheet metal ceiling with cove, just executed by the American Corrugating Company of that city. The room has an area of 81 feet 9 inches by 21 feet 4½ inches, and in the treatment of the ceiling the company make use of plates 32 inches square with 1⅜ inch relief, and of German Renaissance design. The plates with both the plain and enriched center are stamped from one sheet of metal. A full lap of the mold extends around each intersecting panel, thus making a thoroughly dust proof and invisible joint. The ceiling was put up over plaster and the furring was leveled before any of the plates were put in position. In some places the furring touched the plaster, and in others it was necessary to fur down as much as 3 inches.



Fine Example of Sheet Metal Ceiling Work.—Interior View, Showing Appearance of the Completed Ceiling.

FLASHINGS.

It is stated that the promoters of the co operative Sheet mill to be built at Scottsdale, Pa., have completed their plans and that work on the new plant will be begun at once. Over $140,000 is said to have been subscribed.

An inquiry was in the market this week from a large New York City export house for a quantity of Galvanized Corrugated Iron for early shipment to the British West Indies. Heretofore such shipments have been found out of the question owing to the cheaper price at which British made material could be obtained.

The Illinois Roofing & Supply Company, 203 Lake street, Chicago, believe in taking some of the medicine they prescribe for other people. They have just completed decorating their office and counting room, having among other improvements put up a very handsome Steel Ceiling. It is constructed with square panels, having deep beams forming the divisions, and is also heavily coved and friezed, altogether forming a fine sample of the work which can be done with the goods offered by this company.

David Lipton's Sons, manufacturers of Architectural Sheet Metal Work, Philadelphia, have just issued a 104-page catalogue descriptive of their line of Cornices; Bay, Oriel, Dormer or Mansard Windows; Window and Door Heads, Conductor Heads, Roof Crestings; and Finials, Ridging, Skylights and Ventilators. The book is profusely illustrated, printed on fine paper, and bound in black stiff paper covers with the firm's card embossed in silver on the front and their trade-mark on the back.

O'Gara Brothers are building a one-story brick building 16 x 75 feet at 8 Summer street, Worcester, Mass., in which they will prepare Tin for their roofing business. They are now very busily engaged with contracts for Tin and Slate Roofing.

The Foerster Company, 806 Fifth street, New York City, have been awarded the contract for the copper and tile work in connection with the new school house occupying an H-shaped plot running through from 108th to 109th street, this city, and having a frontage of 200 feet on each street. The amount of the contract exceeds $20,000.

The Struthers Iron & Steel Company, Struthers, Ohio, are now in the market as makers of Galvanized Sheets.

The Cleveland & Buffalo Transit Company have decided to build a new passenger boat duplicating the "City of Buffalo," which has been in service for the past two years. The contract has been let to the Detroit Dry Dock Company, Detroit, Mich.

TIN PLATES.

THE SHENANGO TIN PLATE COMPANY.

The Shenango Tin Plate Company of New Castle, Pa., have made application for a charter of incorporation. Among those interested in the new concern are John Stevenson and Rufus Patterson of the New Castle Wire Nail Company and W. E. Reis of the Shenango Valley Steel Company. Other capitalists of New Castle are largely identified with the new enterprise. This concern propose to erect what will undoubtedly be the largest tin plate plant ever built in this country, where there are already the largest plants in the world. It is to contain 30 hot mills, 27 cold mills, driven tandem, with all other necessary equipment, all of which will be of the most modern design. A number of Pittsburgh concerns building rolling mill and tin plate machinery have been figuring on the work for some time. Already the contract for the buildings has been let and has been placed with the Shiffler Bridge Company of Pittsburgh. All of the buildings will be of the most approved design and construction and will be steel and iron throughout. Many new features not heretofore in use in tin plate practice will be introduced in the new plant. The exact dimensions of the buildings have not as yet been determined, but the main building will be sufficiently large to accommodate 30 hot mills and 27 cold mills. The new plant will probably be erected near the present plant of the New Castle Steel & Tin Plate Company on land owned by the Phillips heirs and Luther Sample, about a mile south from the center of New Castle. The new company specify that they will take the land if the borough of Mahoning town will come into the city. Should the borough refuse to do so, then the Phillips heirs and Mr. Sample must themselves petition the courts for the admission of their property into New Castle. The reason for this, as given by the new company, is that they want police and fire protection, which they cannot get outside of the city. The contract for the rolling mill equipment is expected to be placed within the next couple of weeks and work on the construction of the plant will be pushed forward as rapidly as possible.

Report on the American Tin Plate Industry.

Col. Ira Ayer, special agent of the Treasury Department, is at present at work on his annual report on the American tin plate industry, covering the fiscal year 1896-97. It will not be ready for publication, however, for some weeks. This report will be of special interest, as it will complete the six years' probation provided for the industry under the terms of the McKinley law of 1890. It will be remembered that this act required, in substance, that during one of the six fiscal years beginning July 1, 1891, and ending June 30, 1897, the total production of tin and terne plates in the United States weighing lighter than 63 pounds per 100 square feet should, as a condition of the continuance of the duty then imposed, equal one-third the amount of such plates imported and entered for consumption in any one of the said fiscal years. Otherwise, according to the act, on and after October 1, 1897, all such plates should be admitted free of duty. How far these requirements have been not only fulfilled but exceeded by the American manufacturers is a matter of trade history. In the fiscal year ended June 30, 1896, the last for which returns of the American production have been published, the net importations of foreign tin plate were 236,000,000 pounds, while the American production exceeded 265,000,000 pounds. In the past fiscal year the increase in the domestic output over the importations was very considerably more pronounced. It is safe to say that the progress of the American industry has far exceeded the wildest expectations formed for it by the most enthusiastic upholders of the McKinley law seven years ago.

Declining Tin Plate Imports at Atlantic Ports.

The returns of imports of foreign tin and terne plates at the four principal Atlantic ports—New York, Philadelphia, Boston and Baltimore—during the nine months ended September 30, 1897, show an aggregate falling off in such entries of over 200,000 boxes as compared with the corresponding period of last year. The decline was not so marked at New York as at the other three ports named, owing to the fact that New York now, and for some time past, has received almost all the Welsh tin plate entered on the Eastern seaboard. Shipments to other points on this coast are becoming more and more infrequent. Although the comparative decline at New York has been moderate—from 907,874 boxes in 1896 to 849,476 in 1897—Philadelpha's recepts of tin plate have fallen over 50 per cent., while Baltimore's and Boston's figures this year show a decline of about 80 per cent. as compared with last year. The following table gives the receipts of tin plate in boxes at the four ports referred to for the first nine months of the four years 1894 to 1897 :

	1894.	1895.	1896.	1897.
New York	1,465,201	1,114,633	907,874	849,476
Philadelphia	199,143	147,371	46,957	23,008
Baltimore	694,585	630,608	102,352	22,195
Boston	106,194	95,039	54,766	9,342
Totals for nine months	2,465,843	1,987,651	1,111,949	904,021

American M F Plates.

The Ellwood Tin Plate Company of Ellwood City, Pa., officially advise the trade from their general office at Cleveland, Ohio, of the arrangement mentioned a short time ago in these columns as having been made with R. B. Byass & Co. of the Margam and Mansel Tin Plate Works, Port Talbot, Wales, whereby the well-known M F brand of terne plates will in future be manufactured by the Ellwood Tin Plate Company at their Ellwood City works. In the circular imparting this information the company state that they will spare no effort to maintain the present high standard of quality and will absolutely guarantee every box of plates bearing their M F trade-mark. A *fac-simile* of a letter from R. B. Byass & Co., appended to the announcement, assures the trade that the M F plates sold by the Ellwood Tin Plate Company "will be in all respects identical with the plates manufactured and sold by them in Wales for over 50 years past." Sidney H. Byass, managing partner of the Welsh firm, joins the directorate of the Ellwood Tin Plate Company, and the manufacture will be under his direct supervision. The Ellwood Tin Plate Company have secured the services of L. L. Abbott as distributing agent for the M F brand. The offices of L. L. Abbott & Co. will be at 136 Liberty street, New York City.

New Tin Plate Plants.

A number of large tin plate plants are being figured on at the present time, and it seems certain that two or three of them will be built. One of these that is being figured on is a 30-mill plant to be erected on the outskirts of New Castle, Pa. Nearly all the tin plate machinery builders in Pittsburgh are figuring on the contract, and it is probable it will be let in a short time, although the contract may not call for 30 mills at the start. A number of parties heavily interested

in the plant of the New Castle Steel & Tin Plate Company, New Castle, Pa., are reported to be prominently connected with the new enterprise. It is also a fact that some preliminary figuring has been done on a large tin plate plant at Hite Station, on the line of the West Penn Railroad, about 20 miles from Pittsburgh. This is to be an 8-mill plant at the start, and it is not improbable the contract for its construction will be let before the first of the year. It is understood that J. W. Place & Co. of New York City have awarded a contract for the erection of a 4-mill plant to be located at Johnstown, Pa. This week the Laughlin Nail Company of Wheeling, W. Va., with tin plate plant at Martin's Ferry, Ohio, placed a contract for the erection of six more hot mills with all necessary appliances, which will double their present capacity. From the above it would seem that the building of tin plate plants for the next six months or more should be quite active. A number of other tin plate enterprises are in an embryo state, and will probably not be given out until after the first of the year.

SCRAP.

The scarcity of Sheet and Tin Plate Bars is still greatly hampering the operations of the Sheet Iron and Tin Plate makers. The Steel works are experiencing an increasingly urgent call for these materials, but they remain much behind in their deliveries and seem quite unable to cope with the demand. Some of the largest Steel works are reported as making preparations to extend their Bar mill facilities. Meanwhile, the difficulty in securing their supplies of Steel is causing much delay in the delivery of Tin Plates by the mills. Were the demand for spot Plates at all heavy the situation would be an uncomfortable one for the consumers.

Commenting on the recent formation at Pittsburgh, Pa., by six manufacturing firms of the Export Iron & Steel Company, for the purpose of extending the trade in American Iron and Steel abroad, *Ryland's Iron Trade Circular* of Birmingham, England observes: "The Americans are an enterprising body of men, and, as a rule, if they take a thing in hand they do it well; it therefore behooves every Iron and Steel firm of this country to watch Mr. Yankee's movements very closely. It will, perhaps, be easier to checkmate early before he holds anything like a strong position on the board. We know well what they can do; if not we have only to look at the Tin Plate trade. In this branch they, in a very short time, built up a huge industry, driving our Welsh friends practically out of their market, and have now made their first shipment toward establishing an export trade in Tin Plates. Enterprise is a notable feature in an American trader and very much wanted in a British trader."

The Monmouthshire Steel & Tin Plate Company, Limited, of Pontymister, Monmouthshire, is the title of a company recently chartered in England, with a capital of $350,000, for the acquisition of the well-known Pontymister Steel & Tin Plate Works. The company propose to extend and develop the plant materially.

The Ætna Foundry & Machine Company, Warren, Ohio, are reported to be running full on orders for Tin Plate Machinery and Tin Mill Equipments sufficient to keep their plant busy night and day for some time to come.

To the list of Terne Plate brands manufactured by the Jas. McDonald & Sons Company, Cincinnati, Ohio, as given opposite the name of that concern in our list of American Tin Plate works of October 2, should be added the following: Cadot's Old Style, Clyde, Redipped and Reinert Redipped.

The Morton Tin Plate Company, Cambridge, Ohio, report that their three-mill plant has been in continuous operation since July 10. Another Morewood stack has just been added to their tin house equipment, making six sets in all. The new stack will be operated exclusively on high grade Charcoal Bright Tin for milk can stock and boiler plates. The company are experiencing an increasing demand for the high grade Plates, of which they make a specialty.

The *Mexican Herald* of the City of Mexico states that Luis Siliceo has applied to the Department of Encouragement of the Mexican Government for a concession to establish a Tin Plate factory in Mexico under the law of May 30, 1893, which empowered the Government to grant special franchises and exemptions to new industries. It is well known that the canning industry in Mexico has been greatly hampered by the lack of cheap Tin Plate from which to manufacture cans to put up fish, fruit, vegetables, &c., which exist in abundance in that country suitable for canning purposes.

A scheme is on foot for erecting two blast furnaces at the Tin Plate town of Llanelly, Wales. Tin Plate manufacturers are said to be interested in the project. The town has lately had added to its industries a large galvanizing plant and an extensive Tinware factory.

As a result of the depression in the Welsh Tin Plate trade and the labor troubles which are constantly cropping up there, a number of the old established works are closing down, some of them going out of the business altogether. The Dafen Works, at Llanelly, one of the oldest in the trade, and which has been recently enlarged by the addition of two new mills, is to be sold, the company having been wound up, and the plant of the Landore Tin Plate Company, at Landore, has been put out of operation permanently. A number of other works are idle, several of which are unlikely ever again to be used for Tin Plate manufacturing purposes.

The Joint Traffic Association have announced a new freight rate on Black Plate of 5 cents per 100 pounds from Connellsville to Pittsburgh, Pa.

The Totten & Hogg Iron & Steel Foundry Company, Pittsburgh, Pa., manufacturers of Rolling Mill Engines, Tin Mills and Rolling Mill Machinery, have lately closed a contract with J. W. Place & Co., bankers, of New York City, for a complete Tin Plate plant to be erected at Johnstown, Pa. The Totten & Hogg Company have the contract for the entire plant from the ground up, including the buildings, the engines, which will be their new improved Ætna Corliss Engines, Boilers, Pumps, Heaters, Mills, Shears, Furnaces, Pickling Machine, Cranes, Floor Plates, &c.

George J. Humbert, president of the Humbert Tin Plate Company, South Connellsville, Pa., was a visitor among the trade this week in New York City. Mr. Humbert is eminently satisfied with the results secured by his Tin Plate works, which have been running along steadily with all four mills for several months past, turning out a fine quality of product. He describes the new town of South Connellsville, which is practically the creation of his own energy and perseverance, as a model manufacturing town surpassed in point of railway communications and proximity to the sources of supply for raw material and fuel by few other places. The lack of sufficient housing accommodation for the workers employed in the various industrial enterprises which have located at South Connellsville is at present the only drawback. This, however, will be obviated before long, as arrangements are being made for the erection of a large number of new dwelling houses.

The residents of Port Angeles, Wash., are very confident that the plans of William Price of McKeesport, Pa., will be carried out and that they will shortly have a full fledged iron and steel plant, including blast furnaces, open hearth steel works and tin plate factory. This is the plant in which workingmen are reported to be anxious to invest their savings. In an interview with a reporter for a local journal Mr. Price is made to say that "now we have much more capital than we need."

F. A. Bancroft, formerly with Casey & Day, Chicago, has been appointed assistant sales agent for the National Tin Plate Company, Anderson, Ind. The company have been manufacturing Coke Tin Plates exclusively, but are now engaging in the production of Charcoal grades in addition.

The sales offices of the American Tin Plate Company, including that of W. B. Leeds, president; Jno. F. Hazen, vice-president, and D. G. Reid, treasurer, have been removed to 1118 Marquette Building, from Indianapolis, Ind.

A New Illuminating Gas.

The name of Eureka gas is given to a new illuminant originated by Hector de Favi of Montefiascone, Italy, which is expected to rival acetylene. According to *Invention* of London it is obtained as follows: Lime, as pure as possible, is employed as a base, colophony and calcium carbide being added—1000 parts of the mixture ready for use consisting of 900 of quicklime, 50 of colophony and 50 of calcium carbide—and there is said to be no liability of explosion by mixing with air; no heating of water and no special burner is needed. One thousand parts of the mixture give 60 liters of gas at a pressure of 35 mm. of water: and the photometric intensity of the flame is stated to be 92.4 candle hours, while the same amount of calcium carbide employed singly would give only 18 candle hours. Thus, it is asserted, the new gas is 50 per cent. cheaper than acetylene, or that at equal cost it will give half as much more light.

THE RETAIL STORE.

North Dakota Retail Hardware Association.

A meeting of North Dakota retailers was held in Grand Forks on Wednesday last, 29th ult., for the purpose of forming a State organization. Nearly 50 per cent. of the dealers in the State were present in person or represented by proxy. The call for the meeting was read by C. N. Barnes of Grand Forks, to whom is due much of the credit for the organization which followed. Clark W. Kelly of Devil's Lake was chosen temporary president, and George A. McCrea of Drayton, temporary secretary. The president then proceeded to state the object of the meeting, and called upon J. E. O'Brien of Crookston, Minn., a member of the Executive Board of the Minnesota Hardware Dealers' Association. Mr. O'Brien's remarks were listened to with much interest. He said :

MR. O'BRIEN'S ADDRESS.

Owing to the many matters that have commanded my attention in the past few weeks, I come before you, I may say, wholly unprepared to discuss the subject that you meet here to-day to consider, representing what I am pleased to call your 'brothers from Minnesota' in this great movement to better trade conditions, and on behalf of our president and the members of our organization to welcome you into our brotherhood, and bid you God speed in your efforts directed against placing the vast retail business interests of our country in the hands of a few, there to be controlled and manipulated in years to come by trusts and combinations that the few can form to the detriment of the masses. It is not impossible, should present trade conditions exist, to see the retail Hardware business worthy of mention of your great State placed in the hands of a few men—three or four located under three or four roofs, in possibly two cities—and should that condition be brought about what will become of the now convenient market place for the great mass of your people that are engaged in agriculture ? Will they be compelled to flag a train when they want to send their produce to market ?

What will become of your beautiful cities, towns and villages that dot your fertile prairies ; that to-day are used to a great extent in measuring and determining the value of the farm lands that surround them ? Will their business blocks become tenantless and taxless ? What will become of the great army of trustworthy and capable young men who are acting in the capacity of our confidential clerks, for we find that nearly every person we employ must be qualified to fill that important position many times during the year, and they command a salary measured by their honesty, integrity and ability that will furnish them a comfortable living for themselves and their families. Will they have to give way to persons who require the constant care and watchfulness of an overseer, and this oftentimes at an age when they should be receiving an education, and who rarely ever rise above the position they occupy, and whose situation is always for sale to the lowest bidder, because it can be filled at any moment by almost any person ?

What will become of your farmer who has to ask his merchant for credit from spring to fall ? Will he be compelled to give up his home, and he and his family work like slaves for some capitalist at low wages all their lives ?

No, my friends, this centralization of the vast retail business interests of this country must not continue The Minnesota retail Hardwaremen have spoken in plain and no uncertain tone, and the force of their arguments is felt at every trade center in the United States, and re echoes back with a cheerful submission to the will of our organization.

Organization is mighty, but it must be complete. It must embrace every person interested in its success. Petty jealousies must not interfere with this plain duty that we owe ourselves, our families and our country ; but united we should stand for fair and reasonable principles that should govern our organization. We are not monopolists ; we are anti-monopolists. We aim to increase the number of dealers in our line of trade rather than decrease them. Where trade is concentrated in the hands of a few, there monopoly has its birth. Where it is placed in the hands of the many, monopoly is unknown.

The principles for which we contend mean the upbuilding of your cities, villages and towns. If we fail, a few dealers in large cities will control mercantile trade in all its branches, crushing out all rivalry in your State, and erecting the despotism of their monopoly to the great detriment of your people.

In conclusion, I wish to say again that the Minnesota Retail Hardware Dealers' Association welcomes your organized effort, and will be in full accord with you in the enforcement of your resolutions, and ask of you that you give your support toward the organization of States now organized into a national organization, for it is on the successful consummation of national unity that the success of this movement largely depends.

The jobbers who were present were also called upon for an expression of opinion as to the advisability of forming such an organization. T. G. Walthers of the C. W. Hackett Hardware Company of St. Paul gave his opinion from the standpoint of a jobber, and stated that the interests of the retailers and jobbers were identical, and that they would be pleased to give all the assistance in their power to aid in forming the desired organization in the State of North Dakota. A. M. Marshall of the Marshall-Wells Hardware Company of Duluth also indorsed the movement and urged the formation of an organization for the mutual benefit of both retailers and jobbers.

Addresses were made by other dealers present, and letters from some of the dealers who were unable to attend were read. The general opinion was that an organization should be formed at this meeting. A vote was taken on the proposition to organize, and every dealer present voted in favor of it. The chairman then appointed the following committees : Resolutions and By-laws : H. N. Joy, Hamilton ; C. N Barnes, Grand Forks ; H. F. Strehlow, Casselton ; W. H. Pinkerton, Lakota, and W. R. McIntosh, Bottineau. Permanent Organization : P. L. Pritchard, Hillsboro ; J. F. Newgaard, Grafton, and A. H. Duntley Grandin.

A recess was then taken until afternoon to allow the committees time to make a report. At the afternoon session the Committee on Permanent Organization made the following report through P. L. Pritchard, the chairman of the committee :

1. We recommend a permanent organization. 2. The organization shall be known as the North Dakota Retail Hardware Association. 3. We recommend as president, Clark W. Kelly of Devil's Lake ; vice-president, C. F. Jacobs of Hillsboro ; treasurer, George A. McCrea of Drayton ; secretary, C. N. Barnes of Grand Forks.

On motion the report of the committee was accepted, and the officers thus nominated were declared elected. The Committee on Constitution and By-laws then made a report. The by laws were read section by section, and were adopted by unanimous vote.

On motion, the president, vice-president and secretary made the following selection of an Executive Board : H N. Joy, Hamilton ; H. F. Strehlow, Casselton ; W. H. Pinkerton, Lakota ; J. F. Newgaard, Grafton ; J. C. Le Beau, Grand Forks ; A. H. Duntley, Grandin, and A. J. Smith, Fessenden.

The following resolutions were introduced by H. N. Joy and were unanimously adopted :

Resolved, That the thanks of this association be and are hereby tendered to C. N. Barnes for his work in bringing about this organization, and that he be reimbursed by the association for monies expended for postage, printing, etc.

Resolved, That the thanks of this association be extended to J. E. O'Brien of Crookston, Minn., for his attendance at the meeting, and for his valuable advice and assistance.

The organization being completed a motion to adjourn

was carried, and the next meeting will be held the third Wednesday in February in this city.

During the evening some of the members held another meeting for the purpose of discussing matters in connection with the oil trade, and those who handled this staple article expressed themselves very forcibly on the subject of the Standard Oil Company furnishing oil to the supply houses, who in turn sold it at a much less price than could be done by the average retailers. President Kelly will appoint a Committee on Organization, which will be made up of one dealer from each county, whose duty it will be to secure the membership of each dealer.

THE RESOLUTIONS OF THE ASSOCIATION.

Resolved, That the members of this association confine the purchase of Hardware, Stoves and Tinware to manufacturers and wholesale dealers who sell goods only to firms that are regularly engaged in the retail Hardware business as defined in these resolutions.

Resolved, That it is the sense of the convention that the interpretation of the term "retail Hardware dealer" as set forth in the above resolution, to entitle him to purchase Hardware, Stoves and Tinware, be construed to mean any persons having an established place of business and carying a line of Hardware, Stoves and Tinware, and such goods as are usually kept in a first class Hardware store.

Resolved, Any manufacturer or jobber soliciting orders or selling goods in any town or city where a member of the North Dakota Retail Hardware Association is located and doing business, except it be to an exclusive Hardware dealer in such town or city, shall be considered as working against the interests of said association; provided that nothing in this article shall be so construed as to prevent manufacturers or jobbers from selling to manufacturers in any city or town goods actually used in articles manufactured by them, nor from selling to railroad or transportation companies. The interpretation of this resolution is hereby vested in the Executive Committee.

Resolved, That any manufacturer or jobber in Hardware, Stoves or Tinware furnishing net prices or any discount from list prices contrary to the foregoing resolutions, either by themselves, employees or agents, shall be considered as disapproving the above resolutions.

Resolved, That this association shall, as far as lies in its power, keep a record of all goods sold, and by whom sold, to catalogue houses and department stores, and of all other violations of these resolutions.

Resolved, That any member purchasing goods from any manufacturer or jobber who has been listed by the Executive Committee as disapproving of these resolutions, shall be subject to fine or expulsion, at the discretion of the Executive Committee.

Resolved, That every member of this association is constituted a committee of one, and is expected to report to the proper officers in this State any violation of these resolutions.

Resolved, That these measures are just and necessary for our welfare and a rigid enforcement is demanded.

Resolved, That this convention indorses the above and urges its officers to use their best efforts to bring about the formation of a national association with the end in view that a uniform system of protection for the trade will prevail throughout the entire country.

The American Burner.

American Brass & Lamp Company, 44 Park place, New York, are using in this season's lamps what they call the 1897 American burner. This burner has a positive movement, the wick being raised or lowered by turning a screw, which by means of cast brass gears operates several other cogs which attack the central draft wick in different places. The device is very simple, not likely to get out of order and is very efficient, there being no jerky motion. The company have also enlarged their assortment of lamps by adding to those brought out earlier in the season two distinct shapes in reception lamps. These have vases mounted on metal bases, the vases being something like 10 to 12 inches in diameter and 5 or 6 inches high. The lamps are fitted with porcelain globes, both vase and globe being handsomely decorated in great variety. There are also two distinct shapes somewhat similar in character to those described above, but without metal bases, smaller in size, fitted with ordinary flat wick burners and sold at much lower prices.

One of the most attractive among the exhibits in the American Institute Fair, now open at the Madison Square Garden, New York City, is that of the Hill Whitney Aluminum Company of Boston, Mass. The company's booth is located on the first tier above the main floor and is easily recognized by the glitter of the fine array of Aluminum Ware with which it is furnished. Examples of all the articles included in the long line of H. & W. Cooking Utensils and Household Ware made by the firm are tastefully displayed, and the merits of aluminum ware are convincingly interpreted to the public by the courteous attendants. Particular attention is called to the company's new Victor Broiler and Frying Pan in aluminum, and to Hill's Champion Steam Cooker, which attract a large share of attention.

Aluminum Pepper Shaker.

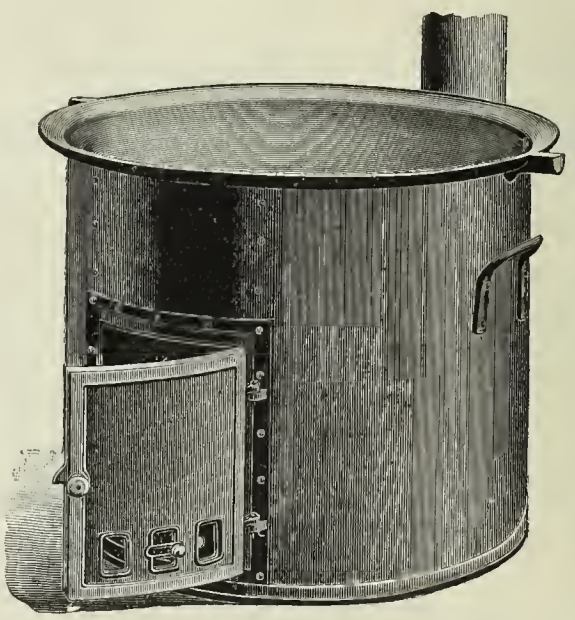
Among the new goods gotten out this season by the Griswold Mfg. Company, Erie, Pa., is the aluminum pepper shaker shown in the accompanying illustration.

Aluminum Pepper Shaker.

These articles are finished in a high polish, except the lower fluted part, which is left in satin finish. The shakers are made with two sizes of holes, adapted for pepper and salt. They are of exceedingly neat and attractive appearance.

Boiler and Feed Cooker.

A boiler which is adapted for use in a variety of ways, but is specially valuable on the farm for preparing feed for the stock, has been brought out by the Wagner Mfg. Company, Sidney, Ohio. This feed cooker is so constructed as to give, it is claimed, very good results with a small consumption of fuel. The kettle is of smooth cast iron and can be instantly removed from the casing, which is of strong cold rolled steel, supported at the bottom by a heavy wrought iron band. Inside of the casing is placed a cast iron flue which carries the products of combustion up and around the kettle before they pass into the smoke pipe. This, the manufacturers claim, brings the entire outside of the kettle in direct contact with the fire, and allows 50 gallons of water to be boiled in a period ranging from 20 to 25 minutes. Legs are dispensed with in order to bring the kettle low down for convenience in use, the entire hight being only 30 inches. A general view of the boiler and feed cooker is presented in the accompanying illustration. The jacket to the furnace is in one continuous sheet of steel, and thus there are no joints

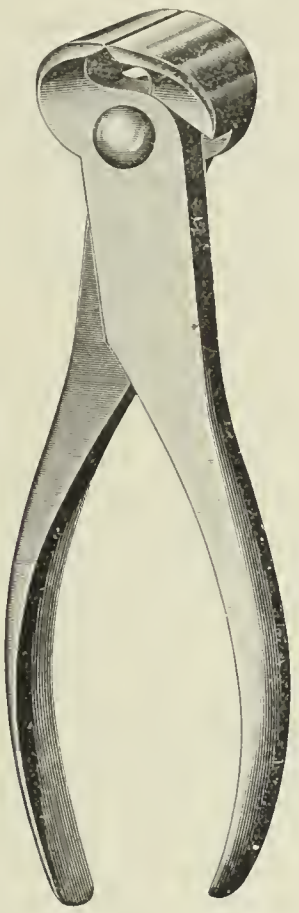


Boiler and Feed Cooker.

to open and take in air. The device is made in three sizes, with capacities of 35, 55 and 60 gallons respectively. The manufacturers state that no foundation is needed for the cooker when it is set on the ground, but when it is to be used on a wood floor it is necessary to make a foundation of 2 inches of ashes, covered with a layer of brick. This may be incased or held in place by four pieces of 2 x 4 scantling about 3 feet long, nailed together at the corners.

End Cutting Nipper No. 60.

Utica Drop Forge & Tool Company, Utica, N. Y., J. C. McCarty & Co., 10 Warren street, New York, selling agents, are putting on the market the end cutting nipper

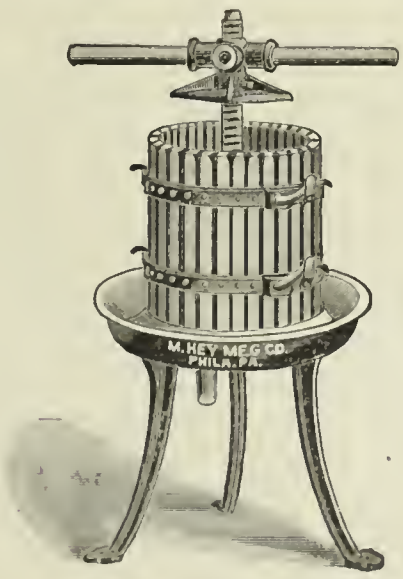


End Cutting Nipper No. 60.

shown herewith. It is described as having a strong and powerful rivet, giving great durability to the tool, and as being so constructed as to cut very easily. The handles are referred to as being very easy for the hand, and the nipper as being extremely useful in cutting hard and heavy wire. It is made in five sizes, running from 5 to 8 inches, and is furnished in both bright and black finish.

Wine or Fruit Press.

M. Hey Mfg. Company, 633-637 North Third street, Philadelphia, Pa., are putting on the market the wine or

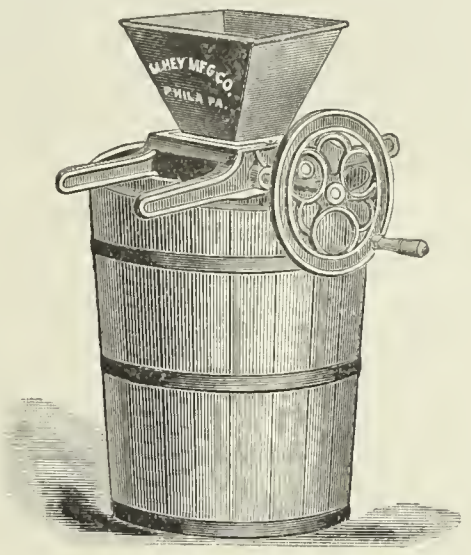


Wine or Fruit Press

fruit press here shown. The screw or spindle of the press runs up through the iron bowl and works on the principle of a bolt. This, it is claimed, obviates the liability to bend the spindle. The cylinder is of wood in lattice form and is made in halves and can be easily and quickly taken apart by simply loosening the four levers shown in the cut. The iron bowl, is lined with white enamel paint. The press is made in three sizes with cylinders 10, 12 and 20 inches in diameter, and 12, 14 and 18 inches high. The smallest size has a cylinder with malleable iron loose pin hinges as fastenings instead of levers.

Grape Mill.

The engraving herewith shows the grape mill which the M. Hey Mfg. Company, 633-637 North Third Street, Philadelphia, Pa., are bringing out. The device is made entirely of iron and is designed for use over any tub or barrel. The grinding parts consist of two grooved rollers, each 4 inches in diameter and 6½ inches long, geared at



Grape Mill.

the back of the hopper and operated by a handle wheel. The hopper is painted on the inside with white enamel and the crushing rolls are coated with shellac varnish so that the juice does not come in contact with the iron. The mill is made in one size only.

Aluminum Griddles and Roaster.

In Fig. 1 is illustrated an aluminum griddle which is manufactured by the Illinois Pure Aluminum Company, Lemont, Ill. From experience with these griddles, the fact has been demonstrated that they require no grease.

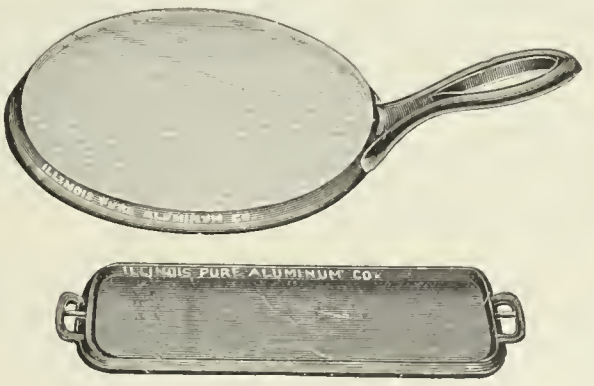


Fig. 1.—Aluminum Griddles.

The metal itself being of a greasy substance will be sufficient to cook ordinary cakes without the usual coating of lard each time the batter is placed upon the griddle. All that is necessary is to wipe these utensils with a greasy

Fig. 2 —Aluminum Roasting Pan.

rag when they first become hot. They are made both round and oblong. The round ones are furnished in four sizes, 9 to 16 inches, and the oblong in two sizes, 16½ and 19½ inches. The company are also putting on the market the aluminum roaster, which is illustrated in Fig. 2.

The roasters are referred to in complimentary terms by those who have had experience with them. The metal is a rapid conductor of heat, and it is claimed that its heat retaining qualities make them superior to ordinary sheet metal roasters. Four sizes are made, ranging from 12 to 16 inches.

MEMORANDA.

The Hill-Whitney Aluminum Company, 90 Canal street, Boston, Mass., issue a new catalogue and price-list in the form of a three-page illustrated folder relating to the H. & W. Aluminum Cooking Utensils and Household Ware, covering over 30 different kinds of articles some of which are made in six or seven sizes. The goods illustrated include Saucepans, Windsor Kettles, Preserving Kettles, Double Boilers, Tea Kettles, Baking and Pudding Pans, Chafing Dishes. Pie Plates, Covered Broilers, Frying Pans, Ladles, Funnels, Cuspidors, Trays, Drinking Cups, &c. as well as Hill's Champion Steam Cooker and the Matchless Coffee Pot, which are patented specialties. The Hill-Whitney Aluminum Company have a branch store at 106 East Twenty-eighth street, New York City.

George G. Spencer, 165 Jackson street, Chicago, has purchased and will operate the entire plant, including the plating works, of the Illinois Handle Bar Company. This addition to his other lines gives him a far more varied product, so that he is now prepared to furnish all styles of Seamless Steel Handle Bars, Rear Forks, Rear Stays of round or D shape, either bent or plain, Fork Sides, Seat Posts, Stems. Frames. Hubs, Pedals, Wrenches or Cold Drawn Seamless Steel Tubing in any reasonable length. Mr. Spencer has just issued an illustrated sheet which shows 14 different styles of Handle Bars, but by no meaus exhausts the patterns he is prepared to furnish. He is pushing the Bicycle Supply business with the same vigor that characterized him during the palmy days of the Cut Nail, when he was such an important factor in the Nail trade.

L. Weaver & Co. have succeeded the Estate of A. F. Sellars in the wholesale and retail Hardware, Stove, Tinware and Sporting Goods business at Hico, Texas. They state that they would be pleased to have manufacturers in their lines favor them with catalogues, prices, &c.

Mitchell, Powers & Co., Bristol, Tenn, who are wholesale dealers in Hardware, Agricultural Implements, Stoves, Tinware, Sash, Doors, Blinds, Buggies, Wagons, &c., have issued a 30-page Stove catalogue which gives an idea of the line of these goods which they are handling. It also calls attention to Feed Cutters, Corn Shellers, Axes, Plows, Roofing, &c.

T. A. Riddle, Johnson, Vt., who has been engaged in the Stove and Tin business at that point for tho past 25 years, has recently moved into a new store, and has added a complete stock of Hardware to his other lines. The business will hereafter be conducted under the style of Riddle Bros. In arranging the shelving, sample boxes, counters, showcases, &c., in the new store. Mr. Riddle states that he has adopted many of the methods illustrated in "The American Hardware Store," believing them to be practical and convenient.

A new firm at Gowrie, Iowa, is the Nelson Hardware Company, consisting of J. F. Nelson, who is interested in the Prusia Hardware Company of Fort Dodge, and Elmer Nelson of Gowrie. They will do a retail business in Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c.

Manchester Hardware Company is the title of a new firm who opened up September 1 at 4245 Manchester avenue, St. Louis, Mo. The company are carrying a $5000 stock of general Harware, Stoves, House Furnishings, Paints, Oils, &c. They are anticipating a good trade with the development of the southwestern part of the city, in which they are located. A. L. Fallon, manager of the business, has had a long experience in the Hardware business, having been connected with the Simmons Hardware Company and A. F. Shapleigh Hardware Company for the past 13 years, and prior to that time for a number of years in the Hardware line at Mercersburg, Pa.

The Dowd Hardware Company have opened up at 31 Pine street, Muskegon, Mich., with a wholesale and retail stock of Hardware, Stoves, Tinware and Agricultural Implements. They are doing business on a cash basis, and refer to trade as quite good.

C. H. Collins & Co. have opened up in the Hardware business at Le Sueur Center, Minn. They have a new store, and are carrying a stock comprising Shelf Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods and Furnaces.

The Marshman Hardware stock, in Montpelier, Ohio, has been purchased by Warren Miller and A. E. Lamberson, who have opened up under the style of Miller & Lamberson. The new firm will increase the stock thus bought with a view to making it complete in the Hardware, House Furnishing, Stove and Tinware lines.

Tucson Hardware Company, Tucson, Ariz., have taken possession of their new store, which they refer to as a very fine one. They state that they have only one counter in the store, a Nail counter. All their wrapping is done on wide ledges in connection with shelving. Instead of drawers on Hardware side of the store they have shelves inclosed by doors, with samples on the outside. All fixtures are finished in natural color of wood. The company wholesale as well as retail, handling Hardware, both Shelf and Heavy, Tinware, Stoves, Implements, Sporting Goods, &c. They discount all their bills.

Aluminum in Structural Work.*

In the use of aluminum for structural purposes the selection of the proper grade that should be used will depend largely upon the specific purpose to which it is desired to apply the metal, but generally speaking, for purposes where aluminum is brought into tension, such as in sheets, or in rolled shapes (as angles, beams, &c.), an ultimate tensile strength of from 32,000 to 40,000 pounds per square inch may be reckoned upon, and a safety factor of 4 gives an allowable working strain of from 8000 to 10,000 pounds. This, of course, is not for pure metal, but for the stronger alloys.

The ultimate tensile strength of pure metal in plates and shapes may be taken at from 24,000 to 28,000 pounds, and with the same safety factor of 4 it gives an allowable working strain of from 6000 to 7000 pounds. For the alloys of cast aluminum in tension, the ultimate strength may be taken at from 18,000 to 28,000 pounds per square inch; using a safety factor here of 5, as aluminum castings are quite uniform and solid, a working strain is obtained of from 3600 to 5600 pounds per square inch. It is difficult to give a value for the ultimate strength of pure cast aluminum in tension, for the reason that while the ordinary pure aluminum will average about 16,000 pounds per square inch, this can be increased very considerably by cold working, and in some cases to as much as 24,000 pounds per square inch. Assuming the average strength and using a safety factor of 4 gives an allowable working strain of from 3200 to 4800 pounds.

In comparison, the alloys of aluminum in rolled plates and structural shapes, such as struts, columns, &c., have an ultimate tensile strength of from 26,000 to 34,000 pounds per square inch, which, using a safety factor of 4, gives an allowable working strain of from 6500 to 8500 pounds per square inch. Pure aluminum sheets and structural shapes in compression have an ultimate tensile strength of from 20,000 to 24,000 pounds per square inch, which with a safety factor of 4 gives an allowable working strain of from 5000 to 6000 pounds per square inch.

Castings of aluminum in comparison can be taken at 16,000 pounds per square inch for pure aluminum and from this to 24,000 pounds per square inch for the alloys. Using again a safety factor of 5 an allowable working strain is given of from 3200 to 4600 pounds per square inch. But the pure metal should not be used in castings, except for electrical purposes, as it resembles pure copper in being difficult to cast and is soft, comparatively weak and has a large shrinkage. In its stead for most casting purposes alloys with from 5 to 20 per cent. of copper, nickel or other hardeners should be used.

The alloys of aluminum in rivets and similar shapes in shear have an ultimate shearing strength of from 24,000 to 27,000 pounds, which, using here a safety factor of 6, gives an allowable working strain of from 4000 to 4500 pounds per square inch. The ratios of the ultimate shearing strength to the ultimate tensile strength for double riveted joints is about 60 per cent., and for single riveted joints the ratio is about 70 per cent. The ratio for steel is about 75 per cent. In bearing, the ultimate value of the alloys of aluminum is from 32,000 to 40,000 pounds per square inch, which, using a safety factor of 4, gives an allowable working strain of from 8000 to 10,000 pounds.

The attention of those contemplating the use of aluminum for structural purposes is called to the fact that the elastic limit is closer to the ultimate tensile strength than in any other of the commercial metals, and for this reason the safety factor of 4 or 5 means a great deal more than it does in steel or iron, where the same safety factor is used. Where any great strength in aluminum is desired, the metal should be protected in such a way that its temperature will not be raised very much beyond that of the ordinary atmospheric temperature, for the reason that aluminum melts at a little less than 1200 degrees F.

The values given above are for temperatures of less than 100 degrees C. (212 degrees F.); for temperatures between 100 degrees and 200 degrees C., the unit strain should be decreased by 50 per cent. and above 200 degrees aluminum should not be designed to be used iu strain.

* From a lecture before the Franklin Institute of Philadelphia, by President Alfred E. Hunt of the Pittsburgh Reduction Company.

Watt and the Measurement of Power.

The following, being the "Watt Anniversary Lecture," was delivered recently at Greenock by William Henry Preece, Engineer-in-Chief and Electrician, General Post Office, London :

The Indicator.

James Watt, who died 77 years ago, was a great inventor. He was "one of the most illustrious followers of science, and one of the greatest benefactors of the world." If he had never improved the fire engine of his, the steam engine of our day, the copying press alone would have maintained his name on the scroll of inventive fame. His greatest invention, that which has been most prolific in exciting further improvements in the steam engine, and which has supplied the engineer with a new sense, is perhaps the indicator. The indicator enables an engine itself to record automatically on paper a diagram which, properly interpreted at leisure, conveys a clear history of the performance of the steam in the cylinder. It enables the engineer to measure the actual work that is being done by it, and it gives a report of the action of the valves and parts which control the ingress and egress of that steam, and which regulate the performance of the machine. It gives an insight into the internal actions of the machine, which, being out of the range of direct observation, are so liable to be misinterpreted. It is to the engineer what the stethoscope and the thermometer are to the physician.

Accuracy in measurement is the foundation of engineering and the secret of practical success. It leads to the detection of error, and to perfection in working. No instrument has been more productive of improvement in this respect than Watt's indicator, and few instruments have been found to require less modification. The conception and development of this apparatus showed that Watt was a long way before his time in grasping the doctrine of energy and applying the practice of graphics. With such an extensive literature on the subject, and with its universal employment by engineers, it is unnecessary to describe the instrument. I content myself by showing you side by side Watt's original instrument—kindly lent by Mr. Tangye of Birmingham—112 years old, and the most recent form designed to meet the requirements of modern machinery. In his patent of 1782, describing his application of the principle of expansion to the economical working of the steam engine, Watt drew a diagram, showing how much he was before his time in the use of graphics and in the conception of the principle of energy. It is quite clear that this mode of looking at the work done in the cylinder led him to consider its automatic record. It was only necessary to know the length of stroke, and to indicate the pressure of the steam upon the piston exerted during each instant of its movement, to obtain the factors of the work done during each stroke. A curve is thus formed by a pencil on a sheet of paper which by its shape gives the whole history of the performance of the engine. The area of the curve, although it contains nearly all we want, is not that which we require to know so much as its mean hight. The horizontal length gives the time of one stroke. The mean hight gives the average pressure exerted during the stroke. We thus learn the work done per stroke, and by multiplying this amount by the number of strokes per minute, and knowing the dimensions of the machine, we obtain the total work done per minute.

The Foot Pound.

The principle of work lies at the very root of the profession of the engineer ; Watt gave us not only the means to measure it, but a system to indicate it. Work done means resistance overcome. It means the application of force through space against this resistance. In Great Britain we employ as our practical unit the force or weight of 1 pound. Our space is measured in feet. Thus if we raise 1 pound 1 foot high against the resistance of gravity, we do an amount of work which we moderns call a foot pound, though Watt did not. The foot pound conveys to them who habitually use it the conception of a reality as distinct as 1 pound of butter. The engineer, like Shakespeare's poet, gives to airy nothing not only a local habitation and a name, but a concrete existence. The French unit of work is larger. It is a kilogram raised 1 m. against gravity, and is called the kilogrammeter. The kilogrammeter contains 7.23 foot pounds.

I have had some difficulty in tracing the parentage of the term foot pound. It came into existence in the forties. Joule, in his earlier papers, spoke of the work done by 1 pound acting through 1 foot. Lord Kelvin writes me, "I believe we had foot pound first from Lewis Gordon, the first professor of engineering in Glasgow University, 1844, the first really of the United Kingdom. We used it thoroughly in Glasgow when I came from Cambridge to be his colleague in 1846. Joule was most pleased to use it; I believe, in fact almost remember, that he got it from me." The English engineer is forced to use the pound weight as his unit of force, not because he is wedded to it, but because the pound and yard are the legal units prescribed by the Legislature. When Parliament thinks fit to introduce a decimal and metrical system the change of units will be easily effected, and we shall experience the inestimable advantage of having one absolute system of measurement employed alike, not only by science and by practice at home, but universally by all European nations. It is not generally known that James Watt proposed, in 1783, a new and decimal system of weights and measures. His unit length was based on the seconds pendulum. His unit weight was to be the unit cube filled with water, and he proposed to weigh all liquids and gases in terms of this unit, in order to express by the same figure specific and absolute weights. There is reason to believe that these ideas were instrumental in framing the splendid system finally made legal in France, in 1801, for Watt himself visited Paris in 1786 and was in intercourse with Laplace, Monge, and other members of the Committee of the Academy dealing with the question. Nothing can prevent this system, probably the child of Watt, from ultimately becoming universal all over the civilized globe.

Origin of the Horse-Power.

Now Watt in introducing the steam engine found the chief competitor he had to meet was the horse. It worked the pumps in mines and brew houses. It drew the ores to the surface. It was employed for grinding and for milling. It was clear that his customers would compare the performances of his engines with that of their horses. He determined by experiment that a good horse, working continuously, could raise 22,000 pounds 1 foot high in one minute. He though he would go one better ; so he said, "I will call 33,000 pounds raised 1 foot high in one minute a horse's power." Thus he gave his customers the advantage of 50 per cent. more work ; but he did more, instead of compelling them to keep relays of horses, each of which could not work continuously more than six or eight hours, he gave them a machine which worked continuously throughout the 24 hours. He showed moreover that, in Whitbread's brew house, his engine "does the work for which 30 strong horses were kept, and consumed 8-10 bushel of coals per hour."

The above definition of a horse's power was singularly unfortunate. It means 15 tons moved at a snail's pace. Few people can grasp the conception. We know what a man can do, especially when rowing a race or when raising bricks. Going up a mountain at the rate of 1000 feet per hour, a fair performance, he does about 1-12 of a horse's power—horse-power—if he weighs 12 stone. Working a treadmill absorbs ⅛ horse-power, which is distinctly hard labor. If he runs upstairs at the rate of 3¼ feet per second he does 1 horse-power, and this is not good for his heart. We also know what a horse can do in drawing a cart or moving a canal barge. Five hundred and fifty pounds moved 1 foot per second—the leisurely pace of a child walking—is more comprehensible than, and the same thing as, 33,000 foot pounds per minute, and is now more frequently used, especially abroad.

But Watt was not the first to use the term horse's power. Savery did this in 1702. "An engine," said Savery, "which will raise as much water as two horses, working together at one time in such a work, can do, and for which there must be constantly kept 10 or 12 horses for doing the same, then I say such an engine will do the work or labor of 10 or 12 horses." Watt, however, gave the unit a scientific character and was virtually its founder. He thus introduced the conception of power as the rate of doing work. His unit of work was 1 pound raised 1 foot high, irrespective of the time in which it was done ; but by conceiving this being done in a unit of time he conveyed the idea of power, a scientific definition of a much abused term. Boulton said at court to George III.: "I am engaged, your majesty, in the production of a commodity which is the desire of kings." "And what is that —what is that ?" asked the King. "Power, your majesty."

Again he was anticipated, for Smeaton in the "Philosophical Transactions" for 1759, in describing his experimental inquiry concerning the natural powers of water and wind, said, "The raising of a weight relative to the hight to which it can be raised in a given time is the most proper measure of power." Watt did, however, introduce the term duty to determine the comparative merits of steam engines. It was introduced by him in Cornwall, and is often known as the Cornish million, for he determined how many pounds could be raised 1 foot high by burning a bushel of coal in his boiler, and found that this could be expressed only in millions. Watt's bushel was subsequently changed in this country to 1 hundredweight (112 pounds), and in the United States to 100 pounds. It has now become practically obsolete, for more effective and more uniform means are adopted to express the relative efficiency of engines.

Five Kinds of Horse-Power.

The term horse-power has probably seen its best days. It is gradually being displaced, and with the advent of the metrical system it will disappear. As a scientific term it has been much abused, and as a commercial term it con-

veys no meaning. Sir Frederick Bramwell wrote in 1883 : "A barrister lately said to the same writer of this report, 'You surely do not mean to tell me that you do not know what a horse-power is, you that have been a mechanical engineer all your life?' The answer given was, 'Indeed, I do not, there is a difficulty in the outset; what sort of horse-power do you mean?' 'Why I mean a horse-power.' 'I know you do, but there are five kinds of horse-power.' 'Five kinds! impossible, it can't be?' 'But there are; I will give you the names and the nature of them : 1. The real horse-power, the power of a horse estimated to lift 22,000 pounds one foot high per minute. 2. That which in James Watt's time was called the nominal horse-power, a horse-power of 33,000 pounds, raised 1 foot high per minute which power he gave all his early engines, so that the purchaser having one and a half times the power of a good horse, should not be in a position to complain of the engine as inadequate. This term nominal is now commonly confounded with the commercial horse-power, and the name theoretical horse-power is substituted to represent that which was received as the scientific horse-power of 33,000 foot pounds. 3. The gross indicated horse-power. This is the whole power developed on the piston of the engine without any deduction for friction, which power, divided by 33,000, gives the gross indicated horse-power. 4. The net indicated horse-power. This is the same as the foregoing, minus a certain allowance for friction. 5. The commercial, or, as it is now frequently called, the nominal horse-power. This is a horse-power about which no two persons can agree.'" Sir Fredrick Bramwell might have added a sixth—viz., electrical horse-power, that which appears in the circuit, or electrical energy.

Is a horse-power really a horse's power Tredgold made it 27,000 foot pounds per minute for eight hours. Rennie assumed 22,000 as correct. Beardmore had a horse weighing a little over ½ ton which did 39,000 foot pounds per minute for eight hours a day. Morin made it 26,150 foot pounds. Two horses will tow a canal boat at 2½ miles an hour, while a steam engine of 10 horse-power is needed to do the same work by means of a screw. Tram cars are drawn by two horses at a speed which the so-called 25 horse-power motor can scarcely do. The horse is really a more efficient machine for a time than the engine and its pull can be directly applied, but he tires and sickens and dies. He is better adapted to certain kinds of work. He can at times expend much more energy than the so called horse-power. At other times he is helpless and hopeless. Thus it appears clear than a horse-power is not a horse's power. The horse-power is based, as I have pointed out, on the British units—pounds, feet, and minutes.

The Present System of Units.

Scientific men are now universally using a system of units based on centimeter, gram and second—hence called the C. G. S. system, to distinguish it from the F. P. S. or British engineers' system. In this system, the unit of work—viz., 1 gram moved through 1 cm. against unit force, is very small, but 10,000,000 of these small units are taken and are called in honor of our great British experimenter, the "joule" and become a practical unit of work. Thus Joule's own mechanical equivalent, the work absorbed in raising the temperature of 1 pound of water 1 degree F. at or about its maximum density, indicated in the F. P. S. system as 778 foot pounds, is in the C. G. S. system the work absorbed in raising the temperature of 1 gram of water 1 degree C. at or about the same maximum density as 4.2 joules. Thus the joule is to the foot pound as 1 to 1.356 and the horse-power, instead of being 550 foot pounds per second, becomes 746 joules per second. The joule per second, or the unit of power, has now been universally called a watt ; and thus in the new system the rate of doing work—that is, the power developed by the steam engine, or any other machine, or by any other process, mechanical or physical—is most appropriately indicated in units bearing the name of our great Greenock inventor. The term watt was applied in 1883 by the late Sir William Siemens to the joule per second, but I had previously, in 1881, at the Paris Congress, proposed to apply it to 1000 joules per second. Siemens' proposal has been preferred, and in consequence the practical unit of power comparable with the horse-power becomes the kilowatt. Had my proposal found favor, the practical unit of power would have been the watt, and Siemens' unit would have been the milliwatt. I venture to think the acceptance of my unit would have hastened the departure of the term horse-power.

I was surprised and pleased the other day to find in Marseilles that the man directing the electric tram cars in that city, corresponding to the driver of the old horse car, sometimes called in America the motorneer, is called the wattman, and I have since learned that this term is very general in France. I hope our friends in Glasgow who are about to introduce electric traction in their city will follow France's good example and honor one of their greatest mechanical heroes by inaugurating the same name in Great Britain. Energy, though so protean in its character, retains its joule throughout all its changes. Every joule impressed on the surface of the ocean by the rays of the sun adds to the moisture of some cloud which, condensed into rain by contact with our cool highlands, feeds a river like that which forms the Falls of Foyers. The engineer directs this falling water through the blades of a turbine, and each joule that passes assists in rotating dynamos to excite strong electro-magnetic fields and powerful currents of electricity, which in their turn produce light, the intensest heat known, and chemical decomposition. This lump of aluminum, the first produced at Foyers, has been extracted from crude bauxite by the expenditure of about 60,000,000 joules. Thus in every stage of its transformations the joule remains the same mechanical unit, while the energy that it measures out proteuses Proteus.

The grand principle of the conservation of energy teaches us that no energy is ever lost. The total energy present assumes a form either useful or useless to man. The skill of the engineer is devoted to render that which is useless useful, and no one has helped him to do this more thoroughly than James Watt. The rapid introduction of electrical energy for electric light, for traction and for the transmission of the waste powers of nature to distant places, is revolutionizing our systems of units. The British Association in 1861 formed a committee to consider the question of general electrical measurement, and aided by Wheatstone, Varley, Balfour-Stuart, Siemens, Matthiessen, Clerk-Maxwell, Joule, Fleeming Jenkin, who have departed, and Lord Kelvin who remains as active as ever, they have so impressed the world by their work that, aided by the Congresses in Paris in 1881 and 1883, in Chicago in 1893, and in London in 1894, the system proposed has been universally adopted, so that electricians in all parts of the world, whatever their nationality or their language, use the same terms, the same measures, and the same units. The ohm is the unit of the resistance, which has to be overcome in any case of the flow of electrical energy ; the volt is the unit of pressure which maintains this energy through this resistance ; the ampere, the result of one volt acting through one ohm, is the unit of current, and the coulomb is the unit of that electrical quantity which is being driven. These are electrical units pure and simple ; but leading from and associated with them are the mechanical units—the joule and the watt.

The watt is universal and exact ; the horse-power is not. The latter equals in England 550 foot pounds per second ; France, 542.47 ditto ; Germany, 582.25 ditto. How can one reconcile such discrepancies Yet the horse-power is maintained in high places with all the fervor and enthusiasm of an old Scotch Covenanter, or the *non possumus* of a good old English Tory. The foot pound per second equals 1.356 watts. The horse-power therefore equals 746 watts. The watt equals 0.7373 foot pound per second. The kilowatt, 1000 watts, equals 1.34 horse-power. If, in order to obtain the value of the power, we divide by 33,000 the ordinary formula, A P S n, where A is the effective area of the piston in square inches, P the mean pressure of the steam in pounds per square inch during one stroke, S the length of this stroke in feet, and n the number of strokes per minute, we get it in horse-power. If we divide it by 44,238 we get it in kilowatts. Horse-powers multiplied by 0.746 are expressed in kilowatts; and kilowatts multiplied by 1.34 are expressed in horse-power. The new system is universally used by electrical engineers.

Electrical Units.

Names, when well selected, secure precision of language ; a watt is a watt and nothing else. A pound, on the other hand, may be either a force, or a mass, or inertia. Names fix ideas. Every electrical workman has a definite and clear conception of an ohm or an ampere. He requires no definition to impress them on his mind. The name alone conveys to him all he wants to know. They become fundamental ideas. There is no ambiguity, hence there is no difficulty either in teaching or in practice. The same benefits would certainly arise if we applied the term kilowatt to the unit of power. No one would have to ask, "What sort of kilowatt do you mean?" The same principle which enabled Watt to examine the interior of his cylinder enables the electrician to examine and record the behavior of his plant and his circuits. Power houses which generate electric currents for supplying electric light or for working trams are generally supplied with recording instruments that tell of the energy expended at each instant of the 24 hours. The engineer has thus before him every moment the history of the whole previous day's work. Here, for instance, is a record of a whole day's work in Rome and here a record of another day at the General Post Office in London.

We are able by means of meters to measure water consumed or gas burnt in our premises. The former is sold by the 1000 gallons and the latter by the 1000 cubic feet. Similarly we measure the electrical energy that is utilized in our houses and factories by the kilowatt hour—that is, we pay 6 pence for every 3,600,000 joules we direct to meet our wants. The custom of paying for power applied is by no means a modern innovation, but it has recently been

made legal by the Electric Light act of 1882. That act makes legal as a Board of Trade standard or a unit a kilowatt hour. It is there defined as 1000 volt amperes per hour; the watt had not then been adopted. Thus the board of trade unit becomes a unit of work done, and we are able to sell as a commercial commodity the work done by 1 kilowatt, or, in Watt's language, the work done by 1⅓ horse-power in one hour. Through the kindness of Lord Kelvin I am able to show you many forms of meter, the offshoot of his own genius and his industry. There is no one who has done so much to secure accurate, sensitive and reliable instruments of precision and of measurement.

Electrical energy is supplied in Glasgow for 6 pence per unit for the kilowatt hour has not yet received a name. It was proposed to call it the "kelvin," and a more appropriate name could scarcely be found, for who is more entitled to share the glory of Watt's name than he who has again made Glasgow University so famous? Lord Kelvin himself objected to its introduction, but in a case of this kind personal wishes scarcely can control the public will, and the necessity for a name is becoming so strong that I shall not be surprised to find electrical energy sold at so much per kelvin, even though it be measured by a Kelvin meter.

I should have liked very much to have diagnosed the causes which have led Scotch universities to dominate so strongly the advances of practical science. The pages of the history of the branch of engineering I have so lightly touched upon teem with the names of Watt, Rankine, Clerk-Maxwell, Fleeming Jenkin, and Lord Kelvin—great towers of light that have brightened up and hastened our rapid progress. Why is it thus? Is it that it needs the strong common sense influence of practice and the wholesome conception of utility, so characteristic of the North, to be impressed on the abstract views of pure science to secure concrete advances in its practical applications? Our English universities are, in this direction, out of the running. They adhere to abstract science. But in Glasgow the doctrine of energy has been crystallized and applied; it is from Glasgow that so much of our engineering knowledge has emanated, it is to Glasgow that we shall continue to look for more light, and it is therefore to Scotland that we must accord all honor.

Some Notes on Electrotyping, Plating and Gilding.

The following article by J. Warren is reprinted from *Electricity*: Electrotyping is the art of effecting a non-adherent, metallic deposit, thick enough that the metal deposited may itself form a fresh object and be capable of a separate existence apart from the original mold, though at the same time preserving the configuration and dimensions of the latter. This art, among the earliest in which electricity plays a part, dates back some considerable time and has proved of great service in the reproduction of valuable casts, seals, medallions and other articles for various purposes.

The first step in the process is the preparation of the mold. The substance originally used for the construction of these necessary adjuncts was plaster of paris. This substance is, however, porous and requires to be rendered impermeable. The materials most commonly used of later years are stearine, wax, marine glue, gelatine, india rubber and fusible alloys. With hollow molds it is a good plan to arrange an internal skeleton of platinum, for ultimate connection with the anodes, in order to secure a good electrical contact with all parts of the mold. When covering several pieces at once it is as well to connect each of them with the negative pole by an iron or lead wire of suitable dimensions.

Having prepared the molds in the usual way—viz., by obtaining an impression in the material when soft and allowing it to set—they should be given a metallic coating on their active surfaces of pure powdered plumbago applied with a polishing brush.

For delicate and intricate objects that known as the wet process is most suitable. It consists in painting the object with two or more coats of nitrate of silver and ultimately reducing it by a solution of phosphorus in bisulphide of carbon.

The baths, which are the next most important item in the process, are always the same, whatever the work in hand may be, and are prepared as follows: A certain quantity of water is put in a jar and to it is added from 8 to 10 parts in 100 of sulphuric acid, in small quantities, stirring continually in order to dissipate the heat generated by the admixture of acid and water. Sulphate of copper (bluestone) is then dissolved in the acidulated water at the normal temperature until it will take up no more. The solution is always used cold and must be maintained in a saturated condition by the addition of copper sulphate crystals or suitable anodes.

For use it should be poured into vessels of clay, porcelain, glass, hard brown earthenware or india rubber. For large baths wood may be used, lined on the interior with an impervious coating of acid proof cement, india rubber, marine glue or even varnished lead sheets.

If the solution be too weak and the current on the other hand be too strong the resulting deposit will be of a black color. If too concentrated a solution and too weak a current be employed a crystalline deposit is obtained. To insure a perfect result a happy medium in all things is therefore necessary.

During the process of deposition the pieces should be moved about in the bath as much as possible in order to preserve the homogeneity of the liquid. If this be not attended to stratification and circulation of the liquid is produced by the decomposition of the anode, and is rendered visible by the appearance of long, vertical lines on the cathode.

For amateurs and others performing small and occasional experiments the following simple apparatus will be found very serviceable. Place the solution of sulphate of copper in an earthenware or porcelain jar, in the center of which is a porous pot containing an amalgamated zinc and a solution of sulphuric acid and water, about two or three parts in 100.

At the top of the zinc a brass rod is fixed, supporting a circle of the same metal, the diameter of which is between that of the containing vessel and the porous pot. From this metallic circle the pieces are suspended in such a manner that the parts to be covered are turned toward the porous pot. Two small horse hair bags filled with copper sulphate crystals are suspended in the solution to maintain its saturation.

I will now pass on to the process of electroplating, or the securing of thin, adhesive, metallic deposits. There are several stages to be passed through in this process, and I will take them in the order in which they come.

Firstly, cleaning the articles to be plated. To remove grease warm the pieces before a slow fire of charocal or coke, or in a dull red stove. Delicate or soldered articles should be boiled in a solution of caustic potash, the latter being dissolved in ten times its weight of water.

We next pass on to the scouring process, which is effected in a scouring bath. The latter is composed of 100 parts of plain water to from 5 to 20 parts of sulphuric acid. The articles may generally be put in hot and should be left in the bath till the surface turns to an ocher red tint.

The articles, after having been cleansed of grease by the potash solution in the first place, must be washed in water and rinsed before being scoured. Copper or glass tongs must then be used for moving the articles, as they must not afterward be handled. For small pieces, suitable earthenware or porcelain strainers may be used.

The next stage is the spent nitric acid bath. This consists of nitric acid weakened by previous use. The articles are left in until the red color disappears, and so that after rinsing they show a uniform metallic tint. The rinsing should be thoroughly carried out.

The articles having been well shaken and drained are next subjected to the strong nitric acid bath, which is made up as follows:

	Volumes.
Nitric acid of 36° Beaumé	100
Chloride of sodium (common salt)	1
Calcined soot (lamp black)	1

The articles must only be immersed in this bath for a few seconds. Avoid overheating or using too cold a bath. They are next rinsed thoroughly with cold water and are again subjected to a strong nitric acid bath to give them a bright or dull appearance as required.

For articles to have, when finished, a bright appearance, plunge them for a few seconds, moving them at the same time rapidly about, in a cold bath of the following composition:

	Volumes.
Nitric acid	100
Sulphuric acid	100
Chloride of sodium	1

Again rinse thoroughly in cold water.

The corresponding bath for a dull or "mat" appearance is composed of:

	Volumes.
Nitric acid	200
Sulphuric acid	100
Sea salt	1
Sulphate of zinc	1 to 5

The duration of immersion in this bath varies from 5 to 20 minutes, according to the dullness required. Wash with plenty of water. The articles will then have a nasty appearance, which will, however, disappear on plunging them for a moment into the brightening bath and rinsing quickly.

The pieces are next treated with the nitrate of mercury bath for a few seconds:

Plain water	10 kgs
Nitrate of mercury	10 grams.
Sulphuric acid	20 grams.

It is necessary to stir this bath before using it. For large articles the proportion of mercury should be greater. An article badly cleaned will come out in various shades and

lacking its metallic brightness. It is better to throw a spent bath away than attempt to strengthen it.

The various pieces, after having passed through these several processes, are then ready for the plating bath.

Now for a few words on the subject of gilding. Small articles are gilded hot, large ones cold. The cold cyanide of gold and potassium both is composed as follows :

Distilled water	10 liters.
Pure cyanide of potassium	200 grams.
Pure gold	100 grams.

The gold, transformed into chloride, is dissolved in 2 liters of water and the cyanide in 8 liters. The two solutions are then mixed and boiled for the space of half an hour.

The anode must be entirely submerged in the bath, suspended from platinum wires and withdrawn immediately the bath is out of action.

Hot Gold Bath.—Zinc, tin lead, antimony and the alloys of these metals are better if previously covered with copper.

The following are the formulæ for the other metals per 10 liters of distilled water :

Crystallized phosphate of soda, 600 grams; alloys rich in copper, 500 grams castings.

Bisulphide of soda, 100 grams; alloys rich in copper, 125 grams.

Pure cyanide of potassium, 10 grams; alloys rich in copper, 5 grams.

Pure gold transformed into chloride, 10 grams; alloys rich in copper, 10 grams.

Dissolve the phosphate of soda hot in 8 liters of water, let the chloride of gold cool in 1 liter of water ; mix little by little the second solution with the first; dissolve the cyanide and bisluphide in 1 liter of water and mix this last solution with the other two. The temperature of the bath may vary between 50 and 80 degrees C.

Silvering.—For amateurs a bath of 10 grams of silver per liter is sufficient. Dissolve 150 grams of nitrate of silver, equivalent to 100 grams of pure silver, in 10 liters of water and add 250 grams of pure cyanide of potassium. Stir it up until completely dissolved. and then filter the solution. Silvering is generally effected cold except in the case of small articles. Iron, steel, zinc, lead and tin are better if previously copper plated and then silvered hot. The cleaned articles are first treated in a nitrate of mercury bath, being kept continually in motion.

With excess of current the pieces become gray and blacken. In the cold bath anodes of plantinum or silver should be employed. Old baths are in this case preferable to new. They may, if required, be artificially aged by the addition of one or two parts in 1000 of liquid ammonia.

If the anode blackens the bath is poor in cyanide. If it becomes white there is too much cyanide—the deposit being too rapid does not adhere. The deposit may be taken as normal and regular when the anode becomes gray during the passage of the current and white again when it ceases to flow.

We now pass on to the subject of nickeling. The first experiments in this industry were due to Smee, who was followed by Becquered and afterward, in 1869, by Dr. Isaac Adams. The vat should be of glass, porcelain or earthenware, or a case lined with impermeable gum. The best nickel bath is prepared by dissolving to saturation, in hot distilled water, nickel sulphate and ammonium, free from oxides of alkalies and alkaline earthy metals. The proportion of salt to dissolve is one part by weight to ten of water. Filter after cooling and the bath is then ready for use.

When the bath is ready and the battery set up, the wires from the latter are joined by means of binding screws to two metal bars resting on the edge of the vat. The bar joined to the positive pole of the battery supports, through the intervention of a nickel plated copper hook, a plate of nickel, constituting the soluble anode, which restores to the bath the metal deposited on the cathode by the electrolytic action. From the other bar are suspended the articles to be plated. These latter should be well polished before being put into the bath. To remove all grease from them, scrub them with brushes soaked in a hot solution of whiting, boiled in water and carbonate of soda.

Copper and its alloys are cleaned well in a few seconds by immersion in a bath composed of ten parts by weight of water and one of nitric acid. For rough articles, two parts of water, one of nitric acid and one of sulphuric acid. For steel and polished castings, 100 parts of water to one of sulphuric acid. The articles should remain in the bath until the whole surface is of a uniform gray tint. They are then rubbed with powdered pumice stone till the solid metal appears. Iron and steel castings are left in the bath for three or four hours and then scrubbed with well sifted sand.

If the current be too strong the nickel is deposited gray or even black. An hour or so is time enough to render the coat sufficiently thick and in a condition to stand polishing. When the articles are removed from the bath they are washed in plain water and dried in hot sawdust.

To polish the articles they should be taken in the right hand and rubbed rapidly backward and forward on a strip of cloth soaked in polishing powder boiled in water, the cloth being firmly fixed at one end and held at the other in the left hand. The hollow parts are polished by means of cloth pads of various sizes fixed on sticks. These pads must be dipped in the polishing paste when using them. The articles, when well brightened, are washed in water to get rid of the paste and the wool threads and finally dried in sawdust.

Aluminum in Place of Brass.

The subject of aluminum as a substitute for brass in various lines of manufacture is one that is attracting an increasing amount of attention. In his recent Franklin Institute lecture on the " Utilization of Aluminum in the Arts," President Alfred E. Hunt of the Pittsburgh Reduction Company gave the results of his experience in the matter as follows :

Aluminum is now sold at a price per pound about equal to that of nickel, and not largely in excess of that of German silver. Volume for volume, it is much cheaper than German silver, and for replacing German silver or britannia metal as a base in silver plated vessels its power of retaining heat and its lightness, together with its much cheaper price, will certainly present such advantages as will cause its extensive use.

In the aluminum trade, the manufacturers have been confronted with the anomalous position that it is necessary for them to sell the metal at prices to compete with brass in sheet, wire, tubes, &c., as cheaply as similar articles are sold in brass. To do this, they have been obliged to put in the plant for the efficient and economical working of aluminum in sheets, bars, wire, tubes, &c., upon a scale sufficiently large to produce the best results, and that before the business was sufficiently developed to warrant the installing of the plant.

The brass manufacturers have the advantage of a large business already established, with many plants working under the most economical conditions as to their facilities for rolling, drawing, &c. It has been the experience so far that the establishments having these facilities for working in brass are not willing to work aluminum at anything like the same relative prices, but have desired a profit of from 50 to 100 per cent. beyond that with which they were content in brass for similar work in aluminum, so that the manufacturers of aluminum have found themselves in the unsatisfactory position of having to put in their own rolling mills and drawing apparatus of the most approved pattern in order to compete in price for work in similar articles of brass. To be compelled to put in the considerable plants necessary for working aluminum at the same time they were developing the business for increasing the output of the ingot metal has proved considerable of a hardship to the manufacturers of aluminum. So far as the experience of the Pittsburgh Reduction Company goes, it is about the same for an aluminum plant as for a steel plant—that it takes about one-fourth the area of the plant for the actual manufacture of aluminum ingots and three-fourths of the occupied territory for plant in working up the metal in foundries, rolling mills and the like.

Aluminum has now reached a point in selling price where it is about equivalent to brass for many purposes. Brass averages from 3.15 to 3.20 times heavier than aluminum, and when the price of brass per pound is multiplied by this factor it will be seen that aluminum to-day is really a cheaper metal than brass for many purposes, and that it will in the future be a question of the " survival of the fittest " between the two metals. It will take years before workmen will gain the experience in handling aluminum as adeptly as brass, occasioned by lifelong experience in working brass. It will take years before the stock of dies will have accumulated with the proper clearance for aluminum over that needed for brass, so that even with aluminum eventually coming out the superior metal, manufacturers must reckon upon only a gradual approach of tonnage of aluminum consumed to that of brass

For many purposes brass is undoubtedly the superior metal. It is essentially a better bearing metal than aluminum. It can be brazed, as aluminum cannot be at the present time—a difficulty which handicaps aluminum from being used in place of brazed brass tubing, &c. Brass can be subjected to a higher temperature under working conditions than can aluminum with its lower melting point, and brass can be soldered more easily than aluminum and the soldered joints made much more lasting.

Aluminum is a very sonorous metal, and it has been used quite extensively for gongs in the place of brass. In metal sheets, whitened by scratch brush or other form of satin finish, aluminum has replaced brass for clock faces to a considerable extent.

A bicycle census recently completed in France shows that during the calendar year 1896, 329,818 wheels were registered, as compared with 256,084 in the preceding year.

STOVE TRADE NOTES.

THE UNION VAPOR STOVE COMPANY.

The adjourned meeting of the Vapor Stove Manufacturers' Association was held at the office of the Standard Lighting Company, Cleveland, Ohio, September 23, 1897, at which time the association adjourned *sine die*, and the Union Vapor Stove Company were organized under the laws of the State of Ohio.

To this company the various manufacturers sell all their patents on gasoline stoves, and the Union Vapor Stove Company in turn license the different manufacturers to manufacture vapor stoves under said patents. This company are supposed to own and control all patents on vapor stoves, and each stove made under these patents will be so designated by a license label.

The company elected Paul Schneider of Cleveland as president, E. C. Baxter of Mansfield as vice-president, and F. L. Alcott of Cleveland as secretary and treasurer.

The B. C. Bibb Stove Company.

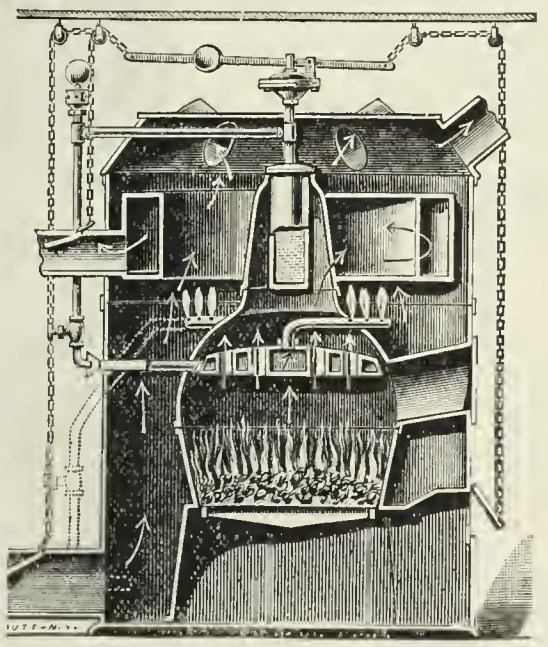
The annual catalogue of stoves, ranges, fire place heaters, furnaces, hollow ware, &c., which is being sent out by the B. C. Bibb Stove Company of 107-109 Light street, Baltimore, Md., and with foundry at Port Deposit, that State, is an attractive publication of 104 pages, measuring 9¼ x 12 inches and bound in cloth lined paper covers. The design of the side title embodies the name of the company with an indication of the lines of goods manufactured, printed in old gold, red and dark green upon a deep crimson ground. The usual notices to the trade relative to terms and conditions are found in the early pages of the volume, together with suggestions to stove dealers with a view to facilitating prompt shipments and the avoidance of delays and errors. There are also outlines of a cook stove and range presented for the assistance of the dealer in naming the different parts for which he may want repairs, following which are general directions for setting and operating stoves and ranges, telegraphic code and illustrations of elevated pipe shelves. The latest addition to the company's line of ranges is the Harford, a six-hole construction, which can be used for burning either coal or wood. The ornamentation is effective yet unpretentious, while the construction embodies the latest improvements. The Tuxedo, another member of this general class, and to which several pages of the catalogue are devoted, has met with a very gratifying reception at the hands of the trade, and there is every appearance of a bright future for it. Other ranges include the Maryland, Newport, Avalon, Arcadia, Glymont, Oriole, the Improved Daisy and the Improved Minor.

The attention of the dealer is next invited to a varied assortment of heaters, of which the Wild Fire, an air tight wood stove, is among the latest productions. This has cast top with an expansion piece, cast bottom, heavily ribbed, cast draft flue and smoke guard, and adjustable smoke pipe collar. The stove is made in two styles, the cheaper having a single casing lined with heavy sheet steel, and the other double casings with a chamber between for the circulation of hot air. There are also shown various styles of Franklins, base burners, sheet iron cylinder constructions and globe and cannon stoves. After the heaters attention is given to the Calvert range, made for brick setting and constructed especially to heat upper rooms. The Harford range is also shown with horizontal boiler, while the Tuxedo is shown in both portable form and in brick setting. Under the name Bolton the company offer a new double oven brick set range, which is furnished with either duplex or plain dumping basket grate. It is made in one size and is of substantial appearance.

Another novelty which the company have brought out in the way of a fire place heater is the Radiant No. 2, this being their smallest production in this line. It embodies, however, all the latest improvements, such as sectional fire pot and magazine, clinker removing grate, &c. Its construction is such that it can be placed in a very shallow fire place and yet sacrifice none of its heating powers. It has been brought out specially to meet the wants of those occupying or building medium sized houses, and the price is made accordingly. An interesting feature of the work is found in the diagrams which are presented showing the proper manner of setting Bibb's Original Baltimore made fire place heaters, these being accompanied by directions for doing the work. A great deal of miscellaneous matter is presented and the catalogue concludes with an index alphabetically arranged.

Positive Air Supply Attachment for Furnaces.

Those who have had experience with the operation of hot air furnaces know how at times it is difficult to secure a supply of air through some one or more of the pipes leading from the furnace. Henry C. Steinhoff, 406 Blum street, Union Hill, N. J., has brought out the device shown in the accompanying illustration, which he claims is a method of securing a positive air supply for hot air furnaces. It consists of a boiler located in the upper part of the furnace exposed to the fire for generating steam for the double purpose of acting as an automatic damper regulator and also of supplying the furnace with air. A pipe is taken from the boiler, which is automatically supplied with water, through the furnace casing to a point where it turns down and is used for forcing a blast of air into a superheater. The superheater is a hollow casting, circular in form with a partition so arranged that the jet of steam and air forced into it must travel completely



Positive Air Supply Attachment for Furnaces.

around it and become heated to a high temperature before it passes swiftly down the outlet from the superheater through a pipe which is placed in the cold air supply duct to the furnace. It is claimed by superheating and expanding the air and the steam a high velocity is secured at the outlet of the pipe which is placed in the cold air duct, the end being located so as to discharge toward the furnace, drawing in with it a strong current of air, insuring, it is said, a constant supply of air to the furnace regardless of the force and direction of the wind outside the building or the length and direction of the hot air pipes attached to the furnace. It is further claimed that the moisture added to the air by the steam jet is sufficient to make it pleasant and avoid the dryness which is sometimes complained of by those whose houses are heated with a hot air furnace system.

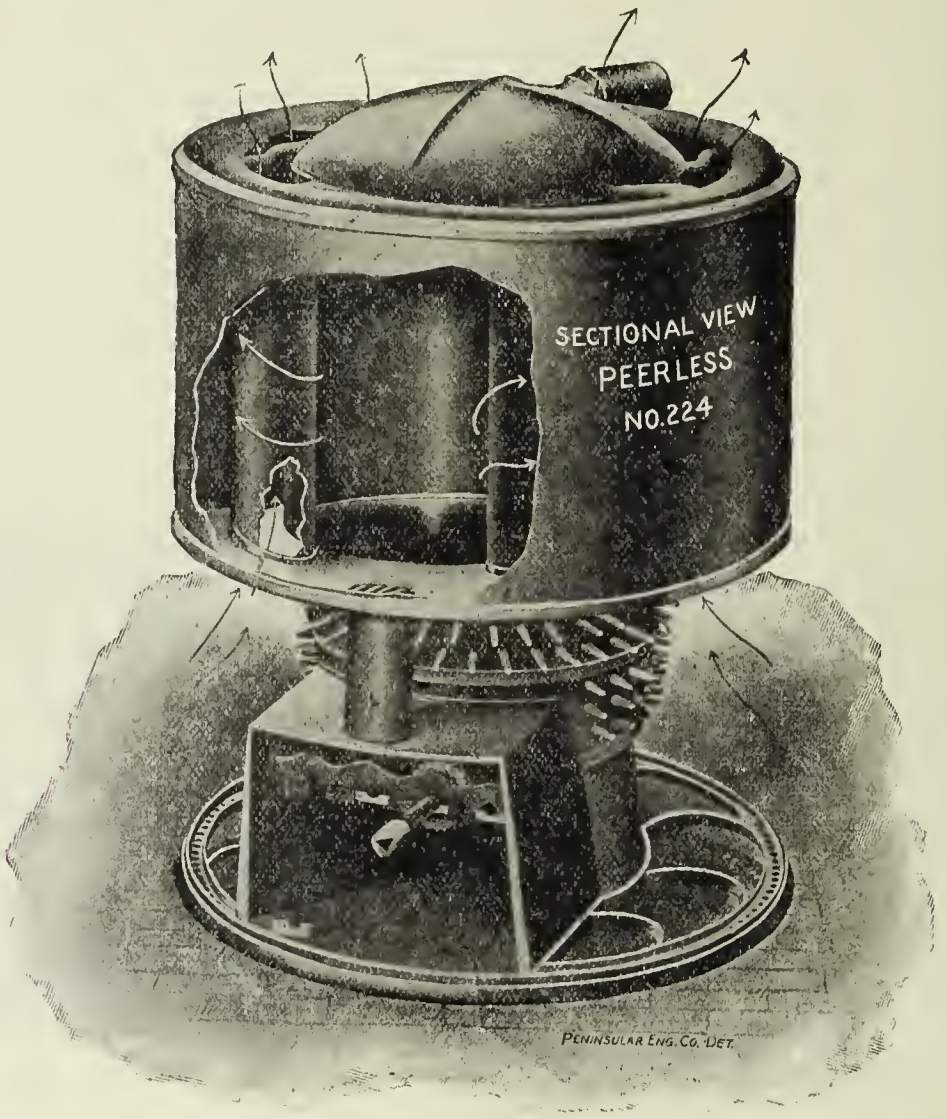
The Kelsey Warm Air Generator.

"How to Warm Your House" is the title of a prettily arranged folder which is being sent to the trade by the Makin-Kelsey Heating & Mfg. Company, 1717 Chestnut street, Philadelphia, Pa. The text of the matter is a description of the Kelsey warm air generator, made by the Kelsey Furnace Company of Syracuse, N. Y. The merits of this heater, not only for use in new houses, churches, auditoriums, &c., while in process of construction, but in places where the ordinary hot air system has heretofore been used, are set forth. As a general thing the same flues can be employed, often, it is pointed out, doing away with one or more fires, with a consequent saving of fuel

that will in the course of a few years pay for the new plant. By means of an attachment which the manufacturers employ in connection with their furnace, rooms located at quite a distance from the generator may be satisfactorily heated. An interesting feature of the folder is a half-tone reproduction from a photograph of the residence of Henry Delaplaine, at Merion, Pa., which is heated by a No. 24 Kelsey warm air generator. A table which is given in connection with the descriptive text gives the dimensions and capacities of the various sizes in which the warm air generator is made.

The 200 Series Peerless Furnace.

In the accompanying illustration we show a sectional view of the 200 series Peerless hot air furnace, made by the Detroit Furnace & Heater Company, Detroit, Mich. The company call attention to this heater as having improvements in construction, among which are a solid ring base and an extra deep ash pit, which is provided with a triangular grate so arranged that it can be entirely removed or replaced within a few seconds. Another feature of the furnace is the amount of surface presented, the fire pot being of the extended surface type so that the air in entering the furnace comes in contact with a series of pins and is not only heated but diffused, preventing a blast of air passing through the furnace without being heated. Above the fire pot is a large double steel radiator so arranged that the greatest amount of surface is provided in it, and to effect an indirect draft so that the principal heat of the fuel consumed is utilized in heating the air. The feed door is made of such size that in addition to burning coal wood may be burned with facility. These furnaces are made in five sizes, with fire pots 18, 20, 22, 24 and 27 inches in diameter. A catalogue containing full particulars and dimensions can be secured on application. The company say, in reference to the fire which recently visited their plant, that they are already established in other quarters, and as their stock of furnace castings was stored where it was not damaged by the fire their shipments will not be delayed. They further state that the popularity of their goods has increased their business this year beyond their expectations, and they are preparing, in building their new plant, to increase their output.



The 200 Series Peerless Furnaces.

The Excelsior Stove Repair Mfg. Company, Quincy, Ill., advise us that they are operating their plant day and night to keep pace with the orders on their new lines of Excelsior, Imperial and Regal Sheet Iron Air Tight Wood Heating Stoves, Up and Down Draft Radiators, and Smokeless Hot Blast Coal Heaters.

A Warning to Buyers of Standard Articles Against Offer of Substitutes.

The gullibility of the average consumer of merchandise of all kinds, says the Chicago *Times-Herald*, is well known and the ability of "shrewd" (we should say dishonest) merchants to palm off imitations of articles which have gained a reputation and are demanded by name is also well known. In making small and insignificant purchases it is not to be wondered at that consumers can often be induced to accept substitutes or articles which are claimed to be "just as good" by the interested merchant, but when it comes to articles of value which are likely to be used the greater part of a lifetime, we think the purchasers of such goods are as foolish as the merchant is dishonest if they allow themselves to buy anything but just exactly what is asked for by name. As a glaring instance of what can be done in this connection, we desire to name but one very well known article of household use—to show what is often attempted and sometimes accomplished. As long ago as 1882 the Michigan Stove Company of Detroit, Chicago and Buffalo placed upon the market a complete line of cooking and heating apparatus for all kinds of fuel and of the highest possible degree of merit, which they marketed under the name of Garland stoves and ranges, and as this name was applied to but the highest grade or quality of each type of stove or range their products were an electric success and the name "Garland" has always stood as the symbol of goods of first grade only, and they are to-day the only goods of their kind sold under any trade name which are not made in several qualities. Other stove makers, counting no doubt upon the credence of the public, commenced to apply a trade name to lines of goods varying in quality from very good down to the cheapest and most inferior grades, and then imitated the shape and style of the Garland trade-mark, even to the shape and arrangement of the lettering—copying even the colors in Garland posters, imitating the designs of Garlands—with the result that many unscrupulous stove merchants have been successful in selling third and fourth grade imitations of Garlands upon the statement

that what they offered were "just as good," &c. The courts have closed the factories of some of the most shameless of these imitators, enjoined others, and yet there are those who escape the pale of the law and continue to dupe the public—whom, we repeat, are themselves to blame for not insisting upon having a Garland and nothing else.

The above is but one of many instances which might be cited, but it is sufficient to show that it is not only small articles of merchandise upon which consumers can be deceived, but large and important ones as well. When will the buying public learn to protect itself?

ODD PLATES.

The display of Andes Stoves and Ranges by M. A. Duane at the Danbury, Conn., fair excelled all previous exhibits of the kind. Among the several grades of Andes shown was the Peerless Andes Range, which won approval on all sides. The Peerless Andes has all the desirable features, being modern, first class, and containing all improvements. The headquarters for the Eastern branch, Phillips & Clark Stove Company, makers of the Andes Stoves and Ranges, is at 139 River street, Troy, N. Y.

The following well-known traveling salesmen, representing Henry N. Clark Company, spent several days this week at their store, 103-105 Blackstone street, Boston: T. W. Burden, O. A. Ballard, J. W. Denny, L. W. Barnes. These gentlemen were absorbing additional information in regard to the season's line of goods, which includes Range, Stove and Furnace Repairs, Stove Dealers' Supplies of all kinds, Parlor Stoves and Furnaces, Refrigerators, Oil Stoves, &c. They will soon start out with revised prices and a complete line of 'Parlor Stoves and Henry N. Clark Company's Furnaces.

The Detroit Stove Works, Detroit, Mich., intimate by means of a colored card which they are distributing to the trade that dealers had better hurry if they wish to secure their share of the coming prosperity. The card is of a size which can be sent through the mail, and has upon the address face a picture of a tiger of fierce expression and extended paws making a flying leap through the air. The picture appears on a colored ground, and underneath in bold faced black letters is the inscription "You'd better hurry." The other side of the card tells why haste is expedient, and winds up with the request that the dealer send for copies of circulars and catalogues which the company have isued. These include their 1897-98 catalogue of Jewel Stoves and Ranges, special information about any of their manufactures, and prints of their series of 1897 newspaper advertisements.

True, Blanchard & Co., Newport, N. H., recently unloaded two carloads of Beckwith Round Oak Stoves, which is said to be the largest shipment of Stoves ever unloaded in Newport at one time.

Samples of Smith's Patent Labor Saving Leather Pattern Fillet are seen in the New York offices of many of the Stove manufacturers, having been sent out by Smith's Pattern Works of Akron, Ohio.

Dunbar & Ashley have hung out a fine new sign at 113 Beekman street, New York City, announcing that they were making a specialty of the Fuller & Warren Company's Hot Air Furnaces and Ranges, and are prepared to do a Sheet Metal contracting business in the heating line for furnace work and indirect and blower systems of steam and hot water heating.

Green & Logan, Bridgeport, Conn., have already set 40 of their Culver Hot Air Furnaces this year, and have several contracts on their books to be filled.

The firm of Bridgeford & Co., Louisville, Ky., have just been reorganized, and C. W. Adams, late of Somerset, Ky., admitted as a partner.

The latest reports from Detroit are to the effect that the Detroit Stove Works of that city are running their plant night and day, the night shift going out at 5 o'clock in the morning and the day force beginning operations at 7 o'clock.

The Eclipse Stove Company of Mansfield, Ohio, have issued a supplementary sheet to their Steel Range Catalogue No. 14, recently sent out to the trade, the two pages of the sheet illustrating a new and smaller size of the Triumph Eclipse Steel Range, which has been brought out since the catalogue was issued. The new Range is of handsome appearance, has duplex grate, and is made only in square top with high closet, high shelf or tea shelf. The oven measures 14 x 18 x 12 inches, the top surface 26 x 31 inches, while the hight of the Stove is 28 inches. The company state that if Catalogue No. 14 has been lost or mislaid another copy will be forwarded on application.

With the enterprise which has marked the progress of John P. Schaffer of 18 Wood street, Pittsburgh, Pa., in the heating trade he is now sending out a vest pocket memorandum book which when opened out full shows on the covers a fine linen handkerchief with a knot fastened in the corner, with the suggestion: "This will remind you of John P. Schaffer." On opening the book the right hand pages have spaces for memoranda, and the left hand pages commence with a high grade Hot Air Furnace, and different pages show a variety of Furnaces and combination Heaters adapted for all kinds of buildings, from the most handsome residence to the building in which the price of the heating apparatus must be very carefully considered. The last page has a calendar for 1898.

The Excelsior Steel Furnace Company, 38 and 40 West Monroe street, Chicago, are making a specialty of large Warm Air and Ventilating Pipes, round and square, of both galvanized iron and tin, and have recently shipped a carload of such material to Muscatine, Iowa, for use in the heating and ventilating of a large school house at that place. These Pipes are used also in connection with steam heating plants for indirect flues, and can be furnished by the company of any size and in any angle desired. They have recently installed a lot of machinery for the manufacture of these goods. J. R. Gill, formerly with Hess, Snyder & Co., and J. Thos. Ryan, late with the Brand Stove Company, both well-known Furnace salesmen, have entered the employ of the Excelsior Company, and are already on the road showing up the merits of the Excelsior line. The Excelsior Company have now six men on their list of travelers, and their shipping department is working overtime to get off the orders which they are sending in.

R. Robinson & Sons, 107 Lake street, Chicago, are doing a specially good business in Furnaces, being behind in their orders owing to the heavy demand. Their largest business is in their tubular Furnaces, the demand being principally for good heating appliances which can be confidently recommended. Some cheaper Furnaces are being sold, but the proportion is small.

Mr. Blymyer, formerly of the Blymyer Brothers Company of Mansfield, has bought out H. R. Hamilton, at 67 Lake street, Chicago, and will represent the Monarch Stove Company in all their various lines for the States of Illinois and Indiana, and will carry a complete line of samples on his floor, look after the trade vigorously both in the city and the two States named and be identified with the Monarch goods from this time on. Mr. Blymyer took possession of the business on September 20, and continues the force of salemen and office help as heretofore connected with Mr. Hamilton.

George G. McMurtry, president of the Apollo Iron & Steel Company of Pittsburgh, sails for Europe on Saturday, October 9. Mr. McMurtry for the past three years has labored early and late at Vandergrift, the new model town of his company, and goes abroad to enjoy a well earned rest. The date of his return is indefinite. During his absence his duties will devolve upon W. P. Bache, the treasurer of the Apollo Iron & Steel Company.

The special board appointed by the Navy Department to consider the needs of the Navy in the matter of new dry docks in their report submitted to Acting Secretary Roosevelt find that five new docks are urgently necessary, while one (the Port Royal, S. C., dock) should be enlarged immediately. The total cost of these docks, with the Port Royal improvement, is estimated at $5,775,000. Four of the docks, the board say, should be of concrete, namely, at Boston, 700 feet long, cost, $1,300,000; at New York, 500 feet long, cost, $1,200,000; at Norfolk, 500 feet long, cost, $1,100,000 (lengthening stone dock, $250,000); at Mare Island, 500 feet long, $1,100,000. Each of these concrete docks is to be completed in two years.

In a preliminary estimate of the amount of gold produced during the calendar year 1897, Mint Director Preston, at Washington, places the world's output of the yellow metal this year at not less than $240,000,000, being an increase in the annual production of more than $35,000,000 over last year. Of this production probably two-thirds will be used for commercial purposes and the other third will be used by the arts. In this case the world's supply of gold available for coin will be increased by a sum of nearly $160,000,000. Mr. Preston believes that the record of silver production will show no increase over last year.

Secretary Hester of the New Orleans Cotton Exchange has issued a statement of the world's visible supply of cotton, covering European points, the amount in transit for European ports and at the interior towns of the United States. He places it at 1,643,921 bales, as against 2,104,922 bales last year. Of this, 1,290,921 bales is American, against 1,827,822 last year, showing a decrease of 641,000 bales. Secretary Hester's statement shows the largest movement of cotton into sight for the month of September on record, except that of last season.

TRADE REPORT.

METAL MARKET.

Pig Tin.—During the early part of the week under review prices weakened somewhat, owing to heavy arrivals and pressure to sell on the part of some importers. Latterly the market has gradually improved, the weighty surplus stock having been closely taken up, sufficiently to leave the spot supply in closer control. The consumptive demand was good with liberal orders both in a wholesale and retail way. No change is made in jobbers' prices for small lots from store, 14¾c. per lb. being the ruling quotation for Straits Pig. There have been arrivals thus far this month of 835 tons.

Copper.—The market has been quiet with a weakish tone, although quotations show no change for the week. Business was of moderate volume, the demand from all quarters being rather below the average. Jobbers quote Lake Ingot at 12¼c., and Ansonia Grade Casting Copper at 11¼c. per lb.

Sheet Copper.—There is not much change to record in this department. The volume of business exceeds that of last year at the same season, and orders are more liberal. Purchasers are confining themselves less to a hand to mouth policy of buying, and are placing stock orders more freely. Prices are getting more uniform as the various mills are filling their order books and recent heavy cutting is not being repeated. The general tendency of prices is decidedy in an upward direction. Manufacturers, as a rue, refuse to quote for extended delivery, looking for a higher range of prices in the not distant future. For spot and early deliveries jobbers quote about 15c. per lb., basis, on small lots of Sheet Copper from stock.

Pig Lead.—The demand has been very tame throughout the week, and whoesale prices gradually softened under the weight of dullness and slighty freer offering from some quarters. At the close, however, there were some indications of an improved feeling, and the market steadied somewhat. In a retail way, business has been fair at slightly lower prices. The ruling rates for small lots of American Pig from store are 4½c. to 4⅝c. per lb.

St. Louis advices are as follows : The market for Pig Lead is without any features of interest. The demand is extremely light, but prices are well maintained.

Lead Pipe and Sheet.—A dull week is reported in these materials. Orders were of a very ordinary character, and prices remain without change. Eastern dealers quote 6¼c. per lb. for Lead Pipe and 7¼c. for Sheet Lead, subject to the customary discount.

Spelter.—There has been no demand here for other than comparatively small lots, such as consumers might need to meet current wants. This and rather freer offering from some quarters gives the market a slightly weaker tone. Quotations for small lots are a shade lower, 4¾c. per lb. being the outside asked by jobbers for Western Spelter.

St. Louis advices are as follows : Some heavy sales have been made during the past week, but no change in price is recorded. The total sales for the month of September are probably larger than in any month for several years past, and the stocks of unsold Spelter are extremely light. There seems to be an understanding among the leading producers not to advance this metal, and the price ruling to-day is more than likely to prevail for the balance of the year.

Sheet Zinc.—A quiet market with unchanged prices is noted. Jobbers quote 5⅝c. to 5¾c. per lb. for 600-lb. cash lots and 6⅛c. to 6¼c. for smaller quantities.

Antimony.—Sales have been very fair, and prices are steady at about 8¼c. to 8½c. for Cookson's, 7¾c. to 8c. for Hallett's, and 7¼c. to 7½c. for Japanese in small parcels.

Nickel.—Prices remain steady at 37c. to 38c. per lb. for small lots.

Aluminum.—A steady run of orders is reported. Prices are firm and unchanged at the list rates established by the Pittsburgh Reduction Company. No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 42c. per lb.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb. Scrap Aluminum is quoted at 30c. per lb., f.o.b. works at New Kensington, Pa.

Tin Plate.—The Steel situation still governs the Tin Plate market to a considerable extent. Mills find great difficulty in securing a sufficient supply of Bars, and are, in consequence, much delayed in their shipments on orders. There is still a scracity in Ordinary Cokes, which for spot delivery command a sharp premium over the current quotations. The demand for these Plates, however, has fallen off considerably during the week, as the canning season is practically over. The market for these, as well as for other lines, is rather dull at present. Prices show no sign of advancing, notwithstanding the firmer tone and the scarcity in the Steel market. In fact 5 cents per box under current quotations is said to have been accepted within a few days in some quarters. In the retail trade only a fair volume of business has been effected. Jobbers' prices are unchanged. Quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do.. 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40: American Charcoal Brights, Melyn grade, IC, 14 x 20, $4.55; Allaway grade, IC, 14 x 20, $4.15; American Charcoal Ternes, IC, 14 x 20. ordinary, $3.50 to $3.60. Foreign Plates sell in a small way only, and prices show no variation.

A special London cable dispatch of October 6, 1897, reports on the British Tin Plate market as follows: Tin Plate is slightly firmer, with prices on the basis of 9s. 4½d. to 9s. 6d. for ordinary Bessemer Cokes, f.o.b. Swansea, and the demand only fair.

Black Plate.—The demand for Black Plate for tinning is good and prices show a firmer tendency. In moderate quantities 2.45c. per lb., f.o.b. Pittsburgh, is quoted.

Sheet Iron.—The Sheet mills are rather hampered in their operations by reason of the inability of the Steel mills to make deliveries. Consequently they are themselves unable to make deliveries as specified in their con tracts. Meanwhile the demand for Black and Galvanized Sheets continues quite heavy, and some scarcity is experienced. Mills that are able to make prompt shipments—and they are few—are getting outside prices. They are all running to full capacity with an unusually heavy tonnage booked. Jobbers are also getting rather more than their recent share of orders for Sheets, although the strike of the cornice makers has restricted the demand in New York City and its immediate vicinity. A report of the meeting of the Black Sheet Manufacturers' Association, held in Pittsburgh on Thursday, will be found elsewhere in this issue.

Chicago advices are as follows: It is difficult if not impossible to secure early delivery for either Black or Galvanized Sheets. Some of the mills are full for the remainder of the year, and others are unable to promise delivery under at least 30 days. Small lots from stock of No. 27 Black are selling at 2.30c. and Galvanized at 80 per cent. off.

Old Metals.—The demand is increasing and prices are stiffening up, holders being less pressing in their offerings. A good export demand exists for Old Copper and Brass. Dealers are paying about the following prices for New York City delivery:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¼c.
Light Brass	per lb. 4¼c.
Lead	per lb. 3¼c.
Tea Lead	per lb. 2¾c.
Zinc	per lb. 2 c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10.00 to $10.50
Heavy Cast Scrap, per gross ton	$9.00 to 9.50
Stove Plate Scrap, per gross ton	5.50
Burnt Iron, per gross ton	4.50

The Philadelphia *Press* announces that negotiations are in progress among a number of capitalists of New York, Philadelphia and Boston which, if successful, will result in the substitution of American built steamships for the large number of foreign built craft now engaged in the West India fruit trade. It is expected that the new vessels will be built by the Cramps at Philadelphia.

THE IRON MARKET.

The only sign of wavering which has developed during the past week in the Iron trade is the weakening in the price of Bessemer Pig in Pittsburgh from $10.75 to $10.25, due partly to efforts to realize on the part of speculators and to a rapidly expanded production.

As against that we have heavy inquiries for Steel Billets and Tin Plate Bars for 1898 delivery, which many of the mills still decline to consider. It is certain, however, that some of the makers are booking business. In the Central West the current consumption of Steel is unprecedentedly large, and is notably urgent in the case of Sheet and Tin Plate Bars. For the present the capacity of the Steel works making them is overtaxed in spite of the fact that a Wheeling mill has remodeled during the summer to engage largely in this branch. Another large mill in the Valleys is to follow in a few months.

The markets in Foundry Iron have been quiet. The leading Southern makers are shipping heavily and are sold far ahead.

Pig Iron.—Aside from some pretty large purchases by a leading Pipe foundry there have been no sales worthy of special mention in the New York market. There is some inquiry for Northern Iron for 1898 delivery, but little has been done in that direction as yet. We quote as follows : Northern brands, No. 1, $11.75 to $12 ; No. 2, $11.25 to $11.50 ; No. 2 Plain, $10.75 to $11. Southern brands, same delivery : No. 1, $11 to $11.25 ; No. 2, $10.50 to $10.75 ; No. 1 Soft, $11 to $11.25 ; No. 2, $10.75 to $11.

Prices of Pig Iron in the Philadelphia market are probably stronger than they have been at any time during the year. The feeling during the past few days has been stronger, owing to the diversion of a good many brands to markets at a distance, leaving few but local brands to supply the nearby trade. The movement has been quite heavy during the week, and so far as Pig Iron is concerned prospects are very favorable. Furnaces are well sold up, and deliveries are taken almost as rapidly as the Iron can be shipped, so that there is no room for complaint. The range of prices for seaboard deliveries may be given as follows, with the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.50; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75.

Sales of local Iron in the Chicago district are still equal to shipments, thus keeping order books comfortably filled. Prices are a little stronger, and quotations have therefore been slightly marked up. Southern Iron is rather quiet, but makers are very firm, showing no disposition to grant concessions to secure further business. Good orders could be had at a slight shading of current quotations, but the furnace companies cannot be moved. Lake Superior Charcoal is in moderate demand. We quote for cash as follows:

Lake Superior Charcoal	$12 50 to $13.00
Local Coke Foundry, No. 1	11 50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

The Pittsburgh Pig Iron market has been quiet the past week. Considerable speculative Iron has been offered and the blowing in of so many Valley furnaces has increased the supply of prompt Iron very much. As a result it has declined in price. The large Steel companies are pretty well covered and will need very little Iron till after the first of the year. On the other hand, higher labor, higher Coke and higher Ore will increase the cost ot making Bessemer next year so that any material decline in the price is not probable. Foundry Irons are quiet. We quote as follows for the balance of the year, delivery f.o.b. cars Pittsburgh : No. 1 Foundry, $10.50 to $10.75 ; No. 2 Foundry, $10 to $10.25 ; No. 3, $9.50 to $9.75; Bessemer, $10.50 to $10.75.

Our Cincinnati representative writes as follows : After the flush times of the past two or three weeks, when customers were as thick and orders as frequent as could be desired, the business of the past week appears quite slow and tame. The fact is the rapid advance in Pig Iron has materially checked the buying movement, and would be purchasers for anything like round lots are holding off and fighting for some concessions. To be sure, there has been some buying, but almost entirely in a small way, with the aggregate not overly large. Opinion here varies as to the course of the market within the next week or so. There are a few inquiries for large lots, and these mainly for delivery next year. The volume of Iron consumed appears to be steadily increasing, and about the only factor which has cut much figure in making the past week a dull one is the fact that most of the furnaces are holding quite steadily to the advanced prices, with the exception, however, of some small lots. In spite of the dullness the market remains very strong and Iron masters were never in a better position to maintain the stand they have taken in regard to prices. Quotations are as follows, f.o.b. Cincinnati :

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

A steady demand has characterized the St Louis Pig Iron market during the past week, and furnaces have advanced their prices 25c. per ton. Many furnaces have their output for the next two months contracted for, and are not in position to figure on orders requiring immediate delivery, and where shipments later in the year are requested higher prices are almost invariably asked. Foundry grades are scarce, without any immediate prospect of any change in this direction. We quote as follows for cash, f.o.b. cars St. Louis :

Southern, No. 1 Foundry	$10.75 to $11.00
Southern, No. 2 Foundry	10.00 to 10.25
Southern, No. 3 Foundry	9.75 to 10.00
No. 1 Soft	10.75 to 11.00
No. 2 Soft	10.00 to 10.25

CHICAGO REPORT.

Scrap.—A very healthy demand is in progress. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$8.50	....
Machinery Cast	7.00	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	4.50	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.00	....
Old Boilers (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	10 c.
Copper Bottoms	....	9 c.
Copper Clips	....	9¾c.
Red Brass	....	8 c.
Yellow Brass	....	7 c.
Light Brass	....	4¼c.
Pipe Lead	....	3¾c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	½c.

Anthracite.—Trade continues quiet, being influenced by the mild weather. The price on carload lots of 12 tons minimum is now as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

The Badger Brass Mfg. Company, Kenosha, Wis., have been incorporated, with a capital stock of $25,000, by C. N. Frost, R. N. Wells and G. A. Yule.

THE HARDWARE TRADE.

Trade continues without much change, there being perhaps less demand from the jobbers upon the manufacturers, the former having sufficient goods to meet their present requirements. Their stocks are, however, steadily depleting under the good demand which comes to them from the smaller houses. The changes in prices are few and unimportant, but the tone of the market continues steady and in some lines it has a decided undertone of strength.

Advices from Chicago.—Shelf Hardware jobbers report a falling off in the volume of business but in the main a fair condition of trade, far removed from dullness. The drought in some localities has cut down the demand for all kinds of goods considerably, while in other sections a better business has sprung up. It is fortunate for the country that the drought was deferred until so late in the season. Coming at this time it is perhaps doing the minimum amount of injury. An improvement in business is confidently expected to follow the appearance of the usual fall rains, cooler and therefore more seasonable weather and the marketing of the new corn crop. Manufacturers are now catching up with orders, and making much better deliveries of Hardware on contracts. Some of the Heavy Hardware jobbers report the demand a little lighter, but others so far have found no check in their trade. The movement of iron and steel from Heavy Hardware stocks has been very active during the week.

Advices from St. Louis.—The Hardware trade is now feeling the effects of the yellow fever in the South and the drought which is prevalent throughout the entire West. These two impediments to trade have had a depressing effect on business, and the hope is that both will shortly disappear. The present week is known locally as "fair week," and traveling men are nearly all in off the road, entertaining country customers who are visiting the city. Business is always moderately quiet during "fair week," and this week promises to prove no exception.

NOTES ON PRICES.

Wire Nails.—Business in Wire Nails continues good, so much so that most of the mills are fully occupied on orders and some of them have their October output disposed of. There is little change in the market so far as prices are concerned. New York quotations are about $1.70 for small lots from store.

Advices from Chicago.—An improved demand for Nails is reported by manufacturers and the largest concerns are well sold up and holding prices firmly. Some of the others, however, who are not so well supplied with contracts, have yielded slightly and prices may therefore be quoted a little lower than last week. Jobbers report a continued good movement from stock and quote small lots at $1.60 to $1.65.

Advices from St. Louis.—The demand for Wire Nails is only moderately heavy. Jobbers are selling small lots from store at $1.65, base.

Cut Nails.—The market for Cut Nails is reported in excellent condition and the mills East and West are working in harmony. The New York price is $1.53 for less than carload lots.

Advices from Chicago.—The demand is of only a moderate character and small lots from stock are selling at $1.50 to $1.55.

Advices from St. Louis.—The demand for Cut Nails has fallen off considerably, but prices remain unchanged. Less than carload lots are quoted at $1.45, base.

Barb Wire.—The Barb Wire market is in substantially the same condition as last week. The tone is good and the volume of business fair.

Advices from Chicago.—Manufacturers report a very good demand, which comes from all parts of the West. Orders are not large, but the aggregate keeps the mills quite busy. Jobbers are enjoying a fair movement from stock. Prices are unchanged at $1.60 to $1.65 for Painted and $1.90 to $1.95 for Galvanized, in small lots from stock.

Advices from St. Louis.—There is no change to note in this department. Manufacturers are only doing a moderate volume of business. The Texas trade, which is usually fairly heavy at this season, is now cut off by the yellow fever. Prices are well maintained

Smooth Wire.—The market for Smooth Wire shows no change either in prices or in the character of the demand, which continues moderate.

Plumbers' Brass Goods. While the demand in its volume is not all that could be wished, a fair amount of business is being done in this class of goods. Prices are, nevertheless, somewhat irregular and competition is active. Some manufacturers are quoting a holding up price firmly, but others are selling below what, it is claimed, the level of reasonable profits calls for, in view of the condition of the market for raw material. The general tendency of prices, however, is upward rather than in the reverse direction.

Eave Trough, Conductor Pipe, &c.—The break in the agreement of manufacturers of these materials shows no indication of being patched up. Production is considerably ahead of the demand, and the latter is merely moderate. Competition is keen and prices in consequence suffer.

Wrought Iron Pipe.—A meeting of the Wrought Iron Pipe and Tube Manufacturers' Association was held in the Monongahela House, Pittsburgh, on Thursday, September 30. There was quite a large representation of the manufacturers present, the following concerns being represented in person: Pennsylvania Tube Works, Pittsburgh; Spang, Chalfant & Co., Pittsburgh; National Tube Works Company, McKeesport, Pa.; American Tube & Iron Company, Youngstown, Ohio, and Middletown, Pa.; Morris Tasker & Co., Philadelphia; Riverside Iron Works, Wheeling, W. Va.; A. M. Byers & Co., Pittsburgh; Oil City Tube Company, Oil City, Pa., and Ohio Tube Company, Warren, Ohio. Frank J. Hearne of Riverside Iron Works was president and Joseph Brown of Pittsburgh secretary. The meeting was called for the purpose of considering fully the present condition of the Pipe and Tube trade and to consider the advisability of making an advance in prices. After a careful and thorough discussion of the situation it was decided to make a slight advance in prices and the base discounts were changed as follows: Butt Weld Black, 72 per cent. discount; Butt Weld Galvanized, 67 per cent.; Lap Weld Black, 78 per cent.; Lap Weld Galvanized, 70 per cent. The above discounts are subject to a further discount of 10 and 5 per cent. for carloads and 10 and 2½ per cent. in less than carloads. On carload lots there is a freight allowance, but in less than carload lots there is no freight allowance. The discount on Screw and Socket Casings was put at 65 per cent. and on Inserted Joint Casing at 60 per cent. The present condition of the Pipe and Tube trade is referred to by the manufacturers as very satisfactory, there being quite a good demand and the mill very busily employed. The principal reasons given for the advance in prices are the higher prices of Iron and Steel Skelp, and the fact that a number of the concerns have recently advanced wages 10 per cent. and others will probably do so in the near future.

Glass.—The end of September saw the general resumption of the American Glass factories apparently no nearer than at its beginning. Manufacturers are still working upon the formation of a single Glass association, and allow the factional fight among the workmen to prevent them coming to any wage agreement. Small sizes of Glass are scarce. New York jobbers' prices for American Window Glass are 60 and 10 and 5 per cent. discount, and for Imported Glass 85 per cent. discount from the new list published last week, and which goes into effect October 11.

White Lead.—Base material has declined in price slightly. Linseed Oil has also fallen. To this extent market conditions are somewhat weaker. Corroders have made no concessions on either Dry Lead or on Lead in Oil and manufacturers of the various mixtures have deviated very slightly from the prices that they have been quoting for a considerable time past. Jobbers, too, are holding to list prices in about the usual way.

Red Lead.—Nothing more than ordinary business has been effected in Red Lead, and prices are without important change.

Linseed Oil.—There has been a further decline in prices of domestic seed product and the market is still in a very unsettled condition. Sharp competition between conflicting interests and a quite heavy decline in prices of raw material are accountable for the weak condition of the market. Within a few weeks the price of domestic seed has fallen about 10c. per bushel.

Spirits Turpentine.—Dealings have been quite large in the Southern markets and fairly active here. Prices for retail lots moved up steadily and are now at about 35½c. in barrels and 43c. in cases.

George H. Laib, for the past 15 years with the Ahrens & Ott Mfg. Company of Louisville, Ky., and John F. Hazen, Jr., formerly with the John F. Hazen Company and Rogers, Brown & Co., Cincinnati, Ohio, have formed a copartnership as Iron and Steel factors with office at 802 Neave Building, Cincinnati. The new firm will represent leading Iron and Steel manufacturers, among whom are the Riverside Iron Works of Wheeling.

Lead Pipe in Japan.

A recent issue of the *Japan Weekly Times* contains the following : There is a constantly increasing demand in Japan for lead pipes of various sizes, for water, gas and other purposes. Hitherto the chief supply has been drawn from two factories in England and one in France, though of course there are many others in Europe and America. Wakayama Genkichi, formerly in the mechanical department of the Admiralty, is said to have succeeded in setting up a pipe making plant in Japan, after years of industrious attempts and investigations. Pipes of his manufacture have been tested by the Osaka Water Works authorities, with such great success that it has been determined to establish the manufacture of lead pipes on a large scale in Tokio, with a branch also at Osaka.

A Century of Gas Lighting.

A lectnre was delivered in the Public Hall, Belvidere, England, by A. H. Bateman, on the progress of gas lighting during the past hundred years, of which a London gas journal gives the following summary :

Mr. Bateman divided his subject into four sections, dealing respectively with the history, chemistry, manufacture and use of gas. In regard to the first, he described the circumstances under which William Murdoch discovered the illuminating value of the gas resulting from the carbonization of coal. Like most other discoveries, however, its practical application did not, he said, come till long afterward. Having alluded to the work of Lavoisier, Priestley and others, in connection with gas, the lecturer passed on to describe Murdoch's improvements in lighting by means of this illuminating agent, and also those of Winsor. Coming down to 1812, when the National Light & Heat Company were formed, and granted a Royal charter, he traced the further progress of the invention, and the lighting of Westminster Bridge, St. Margaret's parish, the City of London, South London and all the large provincial towns, during the following years. The subsequent history of gas lighting had, he said, been merely improvements of detail Clay retorts had replaced iron ones ; more pains were taken with purification ; and exhausters were largely used. Most important of all the later discoveries was the value of the residual products, and the extraordinary series of coal tar derivatives. Reference to these matters naturally led the lecturer on to the second section of his subject—viz., the chemistry of gas manufacture. He showed that this consists in taking to pieces, so to speak, the materials composing coal, and producing therefrom crude, and finally purified gas. Upon the complete evolution of the latter from the former depends, he said, the quality of the distributed article. But, even in its purified condition, it was still a complex fluid. The great thing was to get rid of the obnoxious properties of gas. Sulphureted hydrogen was a specially unpleasant one, and therefore every effort was made to remove it before the gas left the works. Ammonia, on the other hand, was a very valuable constituent, the extraction of which was beneficial to the undertaking, as it was an appreciable source of income. With reference to the process of gas manufacture, which, the lecturer pointed out, must go on continuously, as the cessation of the supply of what had grown to be a common necessity would result in little less than a social cataclysm, the whole of the operations were explained by means of a small model. Commencing with the placing of the charge of coal in the retorts, he traced the gas through the condensers, washers and purifiers, till it finally reached the holder—each appliance being described as he went on. Having conveyed the gas so far, Mr. Bateman gave his audience some information as to the arrangements for testing its quality, and also as to how to use it. He stated that, as a matter of fact, it was a most exceptional thing to find any gas sent out which was not of a perfectly satisfactory quality, and the complaints frequently heard about bad gas were almost entirely due to the extraordinary indifference of the public as to the mode of consuming it. While people recognized the importance of having good grates in which to burn their coals, they were at the same time apparently satisfied with any sort of burners for their gas. and allowed them to be used until they were perfectly worthless before having them replaced. The result was that the good gas made by the companies yielded bad light, owing to the stupidity of most consumers. There was possibly some excuse to be found in the disappointment often experienced from the purchase of so called wonderful burners sold by traveling salesmen. most of which turned out to be worth very little. It could not, however, be too strongly impressed upon the gas consumer that a shilling or two spent on a good burner would save 10 shillings in the course of a year. There were, he said, many excellent burners to be obtained, and he exhibited several specimens and explained their construction. Ordinary gas, as supplied to the general public of Great Britain, gave a light of about 1½ candles per cubic foot when consumed with a common burner ; but with a better class of burner this quantity of gas would give a light of 1¾ or even 2 candles, or with governor burners from 2½ to 2¾ candles. It was, therefore, easy to see how a consumer could nearly double his light, if he only paid attention to his burners. For lighting on a larger scale, and with more expensive burners, a much higher illuminating power could be obtained. The Welsbach incandescent gas light, while requiring some care in using, gave a bright light of 8 to 10 candle-power per cubic foot of gas ; and where regenerative lamps could be employed upward of 10 candles were obtainable from this quantity of gas. Mr. Bateman then referred to other uses for gas, such as for cooking, warming and motive power.

The American *Review of Reviews* for October contains an interesting article entitled "Aluminum: A Newcomer Among Metals," giving the history of the introduction and development of the American process for the manufacture of aluminum and a description of the aluminum works at Niagara Falls, N. Y., and New Kensington, Pa.

Sidney Shepard & Co., Buffalo, N. Y., are introducing what they term Brilliant metal flux for the use of galvanizers. A descriptive circular has just been issued which describes their product. It is an alloy containing the proper percentage of aluminum to produce the best results in the galvanizing bath.

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Metal and Miscellaneous Prices.

CHICAGO, OCTOBER 7, 1897.

Tin—

Straits pigs.....15¼@15½¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
C, 14 x 28		$7.25
X, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
X, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
X, 14 x 56	21.00	$12.50
XX, 14 x 56	24.00	14.00
X, 14 x 60	23.00	13.50
XX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
S T P / L Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.90¢	2.50¢
17 to 20	2 00¢	2.60¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ₩ lb, A... $10.20 } 10%
Patent Planished, ₩ lb, B.... 9.20 } dis.
Craig's Polished Sheet Steel.....8½¢

Galvanized.

First quality.....dis. 80@$0&2½%

Copper—*Ingot.*

Lake..... 12¼@ 12½¢
Casting Brands.....11¾@ 12 ¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .30
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4½¢
Bar.....5¼¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead GalvanizedLapJoint80&25%
Double Bead GalvanizedSlipJoint80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized .....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Cutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin.... ₩ square,	$4.75	$4.50
Galv..... ₩ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20..... 8.00 square
Steel Painted, 14 x 20.. , 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....₩ lb 2 ¢
" " Brown.....₩ lb 1½¢
" " Purple.....₩ lb 2½¢
" " Ground in oil, B. Red, ₩ lb 6½¢
" " Ground in oil, Red...₩ lb 6½¢
" " Ground in oil, Brown, ₩ lb 5½¢
" " Ground in oil, Purple, ₩ lb 6½¢
Linseed Oil, Boiled, in bbls.....35¢
Linseed Oil, Raw, in bbls.....33¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ₩ gal..... .34¢
Spirits Turpentine, in bbls., ₩ gal..31½¢
Asphaltum, Trinidad Refined, ₩ ton.$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.25
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ₩ roll 108 sq. feet.....$1.25
Roofing Pitch, ₩ bbl. of 300 lb.....$3.00

NEW YORK, OCTOBER 8.

The following quotations are for small lots:

Aluminum—
No. 1 Aluminum (guaranteed over 99% Pure), in rolling ingots.
Small lots.....₩ ℔, 42¢
100-℔ lots.....₩ ℔, 39¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ ℔, 34¢
100-℔ lots.....₩ ℔, 33¢
Special casting Alloy, containing over 30% pure Aluminum:
Small lots.....₩ ℔, 35¢
100-℔ lots.....₩ ℔, 30¢
Aluminum Rods, from ⅛-in. diam. to 1 in. diam.....₩ ℔, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 100 ℔s or more.

	6-in. 24-in. ₩ ℔.	25-in. 30-in. ₩ ℔.
¼-in. and heavier	$0.46	$0.46
Nos. 00 to 12	.47	.47
No. 13	.48	.48
" 14	.48	.48
" 15	.49	.49
" 16	.49	.49
" 17	.50	.50
" 18	.51	.51
" 19	.51	.52
" 20	.52	.53
" 21	.53	.54
" 22	.54	.56
" 23	.55	.58
" 24	.57	.60
" 25	.59	.62
" 26	.61	.65
" 27	.63	.68
" 28	.66	.73
" 29	.69	.77
" 30	.73	.81

Note.—Lots of less than 100 ℔s 5¢ ₩ ℔ extra.
Aluminum Wire, B. & S. gauge.
Larger than No. 1.....₩ ℔ 55¢
No. 1 to No. 8.....₩ ℔ 60¢
No. 9 to No. 16.....₩ ℔ 65¢
No. 17 to No. 20.....₩ ℔ 80¢
No. 21 to ——.....₩ ℔ $1.15

Antimony—
Cookson.....₩ ℔, 8¼@8½¢
Hallett's.....₩ ℔, 7¾@8¢
Japanese.....₩ ℔, 7½¢

Brass—Planished.....net
Roll and Sheet .....35% off

Brass and Copper Tubes
Brazed Brass Tubing—
Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per ℔.
¼-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅝-in. up to ½-in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive	.38

35% off.

Copper & Bronze Tubing—
3¢ ₩ ℔ more than Brass.

Conductors—
Corrugated. *Round or Square.*—
Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.
Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats ₩ ℔ 18¼@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—
List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—
Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—
Tin.....70&10%
Galvanized.....80%

Crimped Tubing.
Retinned or Galvanized.....35%

Stove Pipe—
Buffalo Four-Piece

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—
Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*
Galvanized.....70&5%

Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔, 2.00	2.30¢
Nos. 17 to 21	₩ ℔, 2.10	2.40¢
Nos. 22 to 24	₩ ℔, 2.20	2.50¢
Nos. 25 and 26	₩ ℔, 2.30	2.60¢
No. 27	₩ ℔, 2.40	2.70¢
No. 28	₩ ℔, 2.50	2.80¢
American B. B	₩ ℔, 4¢	

Russia, Planished, &c.
Genuine Russia, according to assortment.....₩ ℔, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ ℔, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ ℔, 8½¢

Galvanized.
Nos. 10 to 16.....₩ ℔, 12¢
Nos. 17 to 21.....₩ ℔, 13¢
Nos. 22 to 24.....₩ ℔, 14¢
Nos. 25 to 26.....₩ ℔, 15¢
No. 27.....₩ ℔, 16¢
No. 28.....₩ ℔, 17¢
No. 29.....₩ ℔, 19¢
No. 30.....₩ ℔, 21¢
75&10& 5% off.
36 in. 1¢ ₩ ℔ higher

Kerosene—See *Petroleum Products*

Lead—
American Pig.....4½@4⅝¢
Bar.....5¼¢
Pipe.....6¼¢. 20%
Tin Lined Pipe.....12¾¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....7¼¢. 20%
Old Lead in exchange, 3¼¢ ₩ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—
Per ℔.....37¢

Paints, Oils, &c.—
Lead, White, Atlantic and Jewett's, 100@500 ℔.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1½¢
Red Venetian, American..... @1¾¢
"Donkey" Roofing Paint:
1 quart cans.....50¢
1 gallon cans.....$1.15
10 gallon cans..... 9.00
Linseed Oil:
Raw, ₩ gal..... @36¢
Boiled..... @38¢
Spirits Turpentine:
In bbls.....35½¢
In cases.....43½¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.
Fancy Lagos.....₩ ℔ 5 ¢
Clarified.....₩ ℔ 4¾¢
Accra.....₩ ℔ 4¾¢
Half Jack.....₩ ℔ 4½¢
Cecilia.....₩ 100 ℔ $4.85
Choice Red.....₩ 100 ℔ 4.60
(*Spot Oil, ¼¢. ₩ ℔ higher.*)

Petroleum Products—
In Barrels (Barrel Included).
Stove Gasoline..... ₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—
"Standard" Pipe, 2 to 6 inches.....70%
Fittings, Pipe, " " ..70&10%
Extra Heavy Pipe, " " ..70&10%
Fittings, Heavy Pipe, " " ..70&10%
Large sizes of both kinds.....60%
Fittings for both kinds.....60%

Pipe, Spiral—
Galvanized.....60%
Tin.....60%

Registers—
1897 List:
Japanned.....50% | Solid Bronze..25%
Nickel Plated40&10% | Porcel'n Enam40%
Imitation Bronze.....40&10%
1896 List:
Japanned.....80% | Bronze Plate..75%
Nickel Plated75&10% | Solid Bronze..40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—
Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock. ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ ℔.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—
Common and Good—Strained.
Rosin, C. & D.....₩ bbl. $1.82@$1.83
Rosin, E. & F.....₩ bbl. 1.84@ 1.87
Rosin, G. & H.....₩ bbl. 1.90@ 1.95
Rosin, I. & K .....₩ bbl. 2.00@ 2.05
Rosin, M. & N.....₩ bbl. 2.10@ 2.25

Seamless Brass Tubes—
Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—
According to size, f. o. b. cars, Quarry Station.
Pennsylvania:
Best Bangor, ₩ sqr.....$3.75@$5.00
No. 1 Bangor Ribbon..... 3.35@ 3.75
Pen Argyle, ₩ sqr..... 3.75@ 4.35
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr.... 3.80@ 4.80
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....$2.50@$3.55
Purple, ₩ sqr..... 3.25@ 4.00
Unfading Green, ₩ sqr... 3.75@ 4.50
Red, ₩ sqr..... 9.00@11.00

Solder and Soldering Fluids— Solder—
½&¼ guaranteed..... 10¾@11¢
No. 1..... 9¾@10½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—
Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Kester's Concentrated Soldering Salts.
Per ℔.....50¢
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₩ ℔.....4¢
5% dis.
Walpole Soldering Salts.
f. o. b. Walpole, Mass.
½ ℔ bottles.....₩ doz., $1.50
1 ℔ bottles.....₩ doz., 3.00
In Jars, ₩ ℔..... 10¢
Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, ₩ ℔.....40¢

Soldering Coppers—
Per ℔.....15½¢@17½¢ net

Spelter—
Western Spelter.....4¾¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—
Galvanized.....60%

Tin Pigs and Bars—
Banca, Pigs, ₩ ℔.....15½¢
Straits, pigs, ℔ ℔..... 14¾¢
Straits, in bars, ₩ ℔.....15½¢

Tin Plates, American—
Charcoal Plates, Bright—
N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.55
" "	IX,	10 x 14 / 14 x 20	5.55
" "	IXX,	14 x 20	6.55
" "	IXXX,	14 x 20	7.55
" "	IXXXX,	14 x 20	8.55
" "	DC,	12½ x 17	4.30
" "	DX,	12½ x 17	5.30
Allaway Grade, IC,		10 x 14 / 14 x 20	4.15
" "	IX,	10 x 14 / 14 x 20	4.90
" "	IXX,	14 x 20	5.65
" "	IXXX,	14 x 20	6.40
" "	IXXXX,	14 x 20	7.15

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 ℔.....10¢
95 ℔.....15¢
90 ℔.....20¢
85 ℔.....25¢

Terne Plates—
N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:
Standard Old Style, 36 to 40 ℔ coating..... $11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating..... 10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating..... 8.00 @ 9.25
STP L Grade, 10 to 12 ℔ coating..... 6.75 @ 7.50

Tin Plates, Imported—
Duty, 1½¢ ₩ ℔.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	10 x 14	$5 00
" "	IC,	12 x 12	5.25
" "	IC,	14 x 20	5.00
" "	IC,	20 x 28	10.00
" "	IX,	10 x 14	6.00
" "	IX,	12 x 12	6.25
" "	IX,	14 x 20	6.00
" "	IX,	20 x 28	12.00
" "	DC,	12½ x 17	4.75
" "	DX,	12½ x 17	5.75
Allaway Grade, IC,		10 x 14	4.25
" "	IC,	12 x 12	4.50
" "	IC,	14 x 20	4.25
" "	IC,	20 x 28	8.50
" "	IX,	10 x 14	5.00
" "	IX,	12 x 12	5.20
" "	IX,	14 x 20	5.00
" "	IX,	20 x 28	10.00
" "	DC,	12½ x 17	4.05
" "	DX,	12½ x 17	4.75

Coke Plates, Bright—

Steel Coke, IC,	14 x 20	$4.00
	20 x 28	8.00
	IX, 10 x 14, 14 x 20	4.85
B. V. Grade, IC,	14 x 20	4.00

Terne Plates—

MF, IC,	14 x 20	$6.37½
	20 x 28	12.60
Pontymister Old Style Grade, IC,	20 x 28	11.75
Worcester Grade, IC,	14 x 20	4.25
	20 x 28	8.50
Dean Grade, IC,	14 x 20	4.00
	20 x 28	8.00
Gilbertson's Old Method, IC,	14 x 20	7.50
	20 x 28	15.00

Imported Boiler Plates—

IXX, 14 x 26..(112 sheets)	$9.50
IXX, 14 x 28..(112 sheets)	10.15
IXX, 14 x 31..(112 sheets)	11.25

Troughs, Eave—See *Eave Trough*

Trucks, Stove—
Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—
Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—
List Feb. 1, 1895.
1¼ and less, Plain..... 72%
1¼ and less, Galv..... 67%
1½ and larger, Plain..... 78%
1½ and larger, Galv..... 70%
Boiler Tubes.....60%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%

Zinc—
600 ℔ casks ₩ ℔ 5¾¢ | Per ℔.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Electric Oil Stove Co., Homer, Mich.
Wheeler, Russell & Son, Utica, N. Y.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Souther, E. E. Iron Co., St. Louis, Mo.
Willis Mfg. Co., Galesburg, Ill.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Bake Pans.
Kleckhefer Bros. & Co., Milwaukee, Wis.

Baskets, Metallic.
Metallic Basket Co., Cedar Rapids, Ia.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Bath Tub Seats.
Wetter, H. Mfg. Co., Memphis, Tenn.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Copper.
Randolph & Clowes, Waterbury, Conn.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Center St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Rhodes, Dickelman & Co., Forest, O.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coal Hods.
Shepard, Sidney & Co., Buffalo, N. Y.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.
Obdyke, W. A. & Co., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. *(See Pipe Couplers.)*

Crimping Machines.
Packham Crimper Co., Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, O.

Dampers.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Ct.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.

Eave Trough Hangers.
Berger Mfg. Co., Canton, O.

Eave Trough Strainers.
Alleu, D. C. & Co., Coldwater, Mich.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 8-14 Grand St., New York.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Electric Oil Stove Co., Homer, Mich.
Wheeler, Russell & Son, Utica, N. Y.

Filters, Rain Water.
New Idea Filter Co., Muncie, Ind.

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Excelsior Steel Furnace Co., Chicago, Ill.
Safety Furnace Pipe Co., Detroit, Mich.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D. Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Buckwalter Stove Co., Royersford, Pa.
Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Floyd, Wells & Co., Royersford, Pa.
Fox, F. B., Cleveland, O.
Fox Furnace Co., Cleveland, O.
Front Rank Steel Furnace Co., St. Louis, Mo.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Center St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Heath, Chas. P. & Co., Baltimore, Md.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Mt. Penn Stove Works, Reading, Pa.
Monroe Fdry. & Fce. Co., Monroe, Mich.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Richardson & Boynton Co., 232-234 Water St., N. Y.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Smith & Anthony Co., Boston, Mass
Superior Fdry. Co., Little Falls, N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Turner Heater Co., Bristol, Ct.
Union Stove Works, 70 Beekman St., N. Y.
Walker & Pratt Mfg. Co., Boston, Mass.
Wheeler, Russel & Son, Utica, N. Y.
Wood & Bishop Co., Bangor, Me.

Galvanized Wire.
Shepard, Sidney & Co., Buffalo, N. Y.

Galvanizing.
Gregory, Thos. Galvanizing Works. Brooklyn, N. Y.

Gas Heaters. *(See Stoves and Ranges, Gas.)*

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
Kleckhefer Bros. & Co., Milwaukee, Wis.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Watrous & Co., Troy, N. Y.

Hardware Specialties.
Morris, Jno. B. Foundry Co., Cincinnati, O.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Excelsior Steel Furnace Co, Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Griffing, A. A. Iron Co., 66-68 Center St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Johnson & Co., 84 John St., N. Y.
Mitchell Heater Co., Poughkeepsie, N. Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith & Anthony Co., Boston, Mass.
Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
Kleckhefer Bros. & Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

House Furnishing Supplies.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co., Boston, Mass.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Iron, Galvanized Sheet. *(See Sheets, Galvanized.)*

Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. *(See Sheets, Iron and Steel.)*

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. *(See Ceilings, Metallic.)*

Mica.
Huse, Jos. & Son, Boston, Mass.
Munsell, Eugene & Co., 218 Water St., New York.
Palermo Mica Co., 27 Peck Slip, N. Y.

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Hanson & VanWinkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 8-14 Graud St., New York.

Oil Heaters. *(See Stoves and Ranges, Oil, Vapor and Gasoline.)*

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Blodgett, G. S. Co., Burlington, Vt.

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Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

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Bascom, H. Clay & Co., Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Fitter and Crimper.
Blumer, Doscher Mfg. Co. Brooklyn, N. Y.

Pipe Hangers.
Iwan Bros., Streator, Ill.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
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Oster Mfg. Co., Cleveland, Ohio.
Peck Bros. & Co., New Haven, Conn.
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West Mfg. Co., Buffalo, N. Y

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Willis Mfg. Co., Galesburg, Ill.

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Ætna-Standard Iron & Steel Co., Bridgeport, O.
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McCullough Iron Co., Wilmington, Del.
Meurer Bros. Co., Brooklyn, N. Y.
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Sanborn, J., 217 Water St., N. Y.
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Schwerdtle & Siebert, Bridgeport, Ct.

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Marcy Stove Repair Co., 74 Beekman St. N. Y.
Morris, Jno. B. Fdry. Co., Cincinnati, O.
Morris, J. L., Chicago, Ill.
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Buckwalter Stove Co., Royersford, Pa
Bussey & McLeod Stove Co., Troy, N.Y.
Chicago Stove Works, Chicago, Ill.
Co-operative Foundry Co., Rochester, N. Y.
Eclipse Stove Co., Mansfield, O.
Ferrosteel Co., Cleveland, Ohio.
Floyd, Wells & Co., Royersford, Pa.
Gem City Stove Co., Dayton, O.
Graff & Co., 208 Water St., N. Y.
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Michigan Stove Co., Chicago, Ill.
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Union Stove Works, 70 Beekman St., N. Y.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
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Relneke, Wilson & Co, Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
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Dangler Stove & Mfg. Co., Cleveland, Ohio.
Electric Oil Stove Co., Homer, Mich.
Miller, Edward Co., Meriden, Conn.
Monarch Stove Co., Mansfield, O.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Union Stove Works, 70 Beekman St., N. Y.

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Central Stamping Co., 23 to 25 Cliff St., New York.
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Rochester Stamping Wks., Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Tea Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co Rome, N. Y.

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Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
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Lindas, H., Edgerton, Wis.
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Rhodes, Dickelman & Co., Forest, O.
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West Mfg. Co., Buffalo, N. Y.

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Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphi Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
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Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

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Randolph & Clowes, Waterbury, Conn.

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Canton Steel Roofing Co., Canton, O.
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Iwan Bros., Streator, Ill.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washers, Valves, &c.
Littleford Bros., Cincinnati, O.
Marston, I. G. & Co., Boston, Mass.

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Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

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Phelps, Dodge & Co., 11 Cliff St., N. Y.

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HELP WANTED.

A first-class PLUMBER and TINSMITH; none but sober men need apply; send reference. E. F. Moore, Woodbridge, N. J. Oct. 9

A good all around TINNER and SHEET IRON WORKER for inside and outside work the year round; must be sober. John Lumm & Co., Garrett, Ind. Oct. 9

MILLWRIGHT and ROLL TURNER, by rolling mill; one preferred who is experienced in turning rolls for smooth rolled sheet iron. Answer giving full particulars to "R.," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Oct. 9

A TRAVELING SALESMAN by a concern manufacturing iron bedsteads and gasoline stoves; must be acquainted with the jobbing trade; only man of energy, ability and first-class references need apply. Address, with full particulars as to age, experience, references, salary wanted, P. O. Box 330, Milwaukee, Wis. Oct. 9

A TINSMITH and PLUMBER for steam and hot air heating, roofing, jobbing and assortment work; must be sober and reliable; state age, wages and experience. M. Mond, Ozone Park, L. I., N. Y. Oct. 9

A FURNACE and RANGE SALESMAN for Brooklyn and vicinity; please state terms wanted and give references. Address "Brooklyn," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

A good TINSMITH and JOBBER to come and locate in a live New England town. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

One or two good TINSMITHS acquainted with all kinds of country work will find a steady place all the year round; come at once, or address Frederick L. Frick, Manhasset, L. I. Oct. 9

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A good all-around country TINSMITH and HARDWARE CLERK, one accustomed to roofing, sponting, guttering and plain piping and pump work; steady work to tbe right man; mnst bo sober and willing to work; give reference and state wages. Wm. C. Cook, Branchville, N. J. Oct. 2

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By a good all around TINSMITH; can do inslde and outsido work; also steam and gas fitting; steady and sober; 12 years' experience. W. Pahland, 374 Spring strcet, West Hoboken, N. J. Oct. 9

By a first-class TIN and SHEET IRON WORKER; well experienced in furnaces and ranges, ventilating and jobbing work; New York City or Brooklyn preferred. "Mechanic," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

GALVANIZER and SOLUTION TINNER; over ton years' experienco in all branches; can give instruction in laying of baths. William Whitnum, 363 Leonard street, Brooklyn, N. Y. Oct. 9

By a young man; strictly sober, honest and reliable; would like to finish plumbing and tinning trade; position in a good house where honest efforts will be appreciated and advancement offered; reference first class. Box 6, Dawnsville, N. Y. Oct. 9

By a young man, age 22 years; sober, honest and reliable, with seven years in general hardware, including nearly all branches; would like position with a good retail house where honest efforts will be appreciated and advancement offered; can furnish gilt edge reference. Box 6, Dawnsville, N. Y. Oct. 9

As BOOKKEEPER and SALESMAN in store handling stoves, ranges, furnaces, &c.; six years' experience; figure, estimate or oversee work. "Experienced," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

With some stove, hardware or tin plate firm; either traveling or in the house; 40 years of age, with 23 years' experience in stove and tin business; best of references. Banner M. Allen, Bellefontaine, Ohio. Oct. 9

As FOREMAN or CUTTER in cornice and skylight shop by a first-class draftsman and cutter; can estimate on all kinds of work and handle men to good advantage; can give the best of references. "Cutter," office of *The Metal Worker* 117-119 South Fourth street, Philadelphia, Pa. Oct. 9

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By a young man who has bad experience in a stove store; also a heating and plumbing establishment; understands bookkeeping and is a good salesman; a steady position with some good firm; the best of references furnished on application. P. O. Box 1074, West Winsted, Conn. Oct. 9

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Steady position by a steady, sober TINSMITH who thoroughly understands tin roofing, spouting, pump work and general jobbing done in a country shop; also kitchen boiler connection and iron pipe work; references. "Tinsmith," 173 East Ferry street, Buffalo, N. Y. Oct. 9

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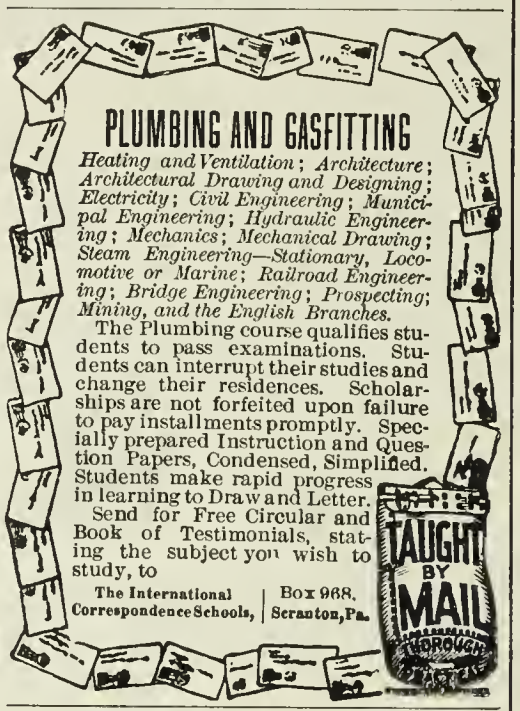
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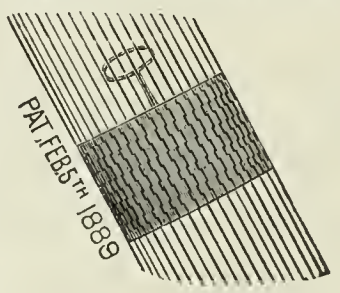

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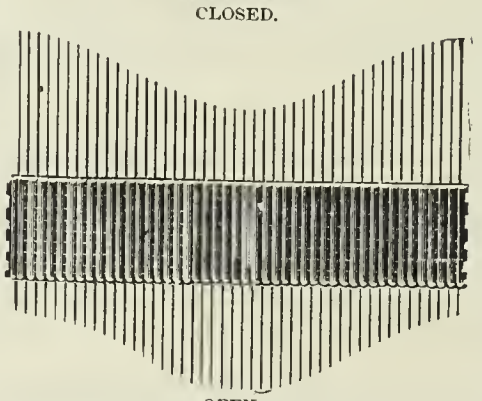

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This manual is, in short, well adapted to the practical requirements of plumbers and gas fitters.

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Making the Plan,
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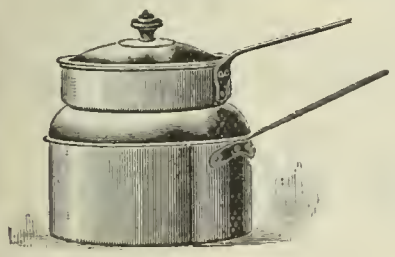

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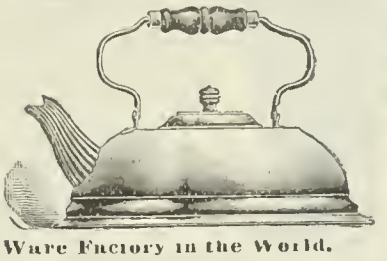

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E. B. STOCKING, Attorney at Law, 611 F ST., N. W., WASHINGTON, D. C.

—THERE would be a deal less of disturbance in this world if when a man had nothing to say he would be silent about it.—*Boston Transcript.*

"Globe" Ventilator.

Brass, Copper, Galvanized Iron and with Glass Tops.

Simple, Stormproof, Effective, Ornamental.

Smoky Chimneys Cured. Send for Model and Pamphlet.

— MANUFACTURED BY —

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SELF LUBRICATING

Rotary Screw Ventilators

WHICH PRODUCE A
Vacuum by Rotation.

The only positive cure for Smoky Chimneys, Poor Draught and Ventilation. Adopted and used successfully on Private Residences, Greenhouses, Hotels, Breweries, Public Buildings, etc., etc. . . . . .

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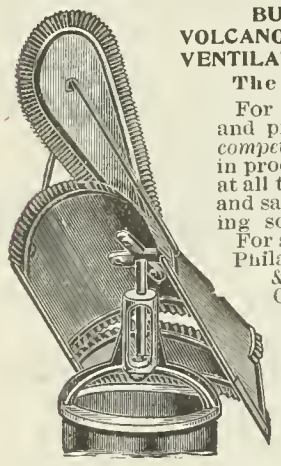

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For simplicity, durability and practicability, *we defy competition.* It is unexcelled in producing a regular draft at all times. Send for prices and sample before purchasing some inferior article. For sale by BERGER BROS., Phila., Pa. GARRY IRON & STEEL ROOFING Co., Cleveland, Ohio. CINCINNATI STAMPING Co., Cincinnati, Ohio. ILLINOIS ROOFING & SUPPLY Co., Chicago, Ill.

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Sole Mnfrs.,
STREATOR, ILL.

—"THERE is no man in Kansas quite so scientific and methodical in his methods of procedure as ex-Chief Justice David Martin. Yesterday he took Topics into his confidence in relation to a trip to Klondike, which he has in contemplation. He has investigated the subject, and finds that a polar bear can go nine months without any food whatever, existing solely upon the fat which he has accumulated upon his bones during the summer. He finds further that the bear wastes away only about one hundred and twenty pounds during this period of starvation, and he figures that he has upon his own person about one hundred and fifty pounds of fat that will enable him to go longer without food than any bear that ever lived. 'The whole problem in Klondike,' said the amiable ex-Chief Justice to Topics, 'appears to be the question of food. I can stay one season without a bite to eat, and come back with a pound of gold for every pound of fat I carry in.'"—*Kansas City Journal.*

—THE Fiancée (vaguely)—If Harry leaves for Boston to-day he won't come; but if he comes to tea we'll know he's here.

Maiden Aunt (bitterly)—I shouldn't judge by appearances—men are so deceitful.—*New York Press.*

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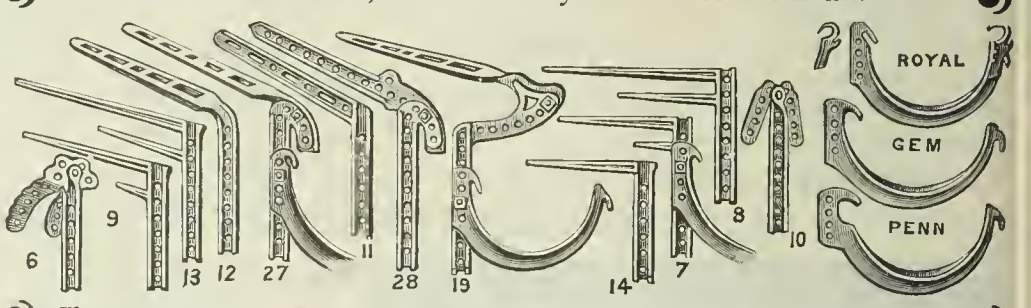
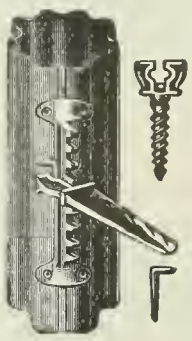
Tinners can find among our complete line a style of hanger to suit any kind of roof; it only requires the proper selection. Attention is called to the **Hinged Shanks,** made for any pitch roof. All are strong and easy to put up, leave a free open gutter, and are neat in appearance. No. 34 is specially made to hang gutter to corrugated iron roofs and awnings. Send for our **HANGER CIRCULAR,** which clearly illustrates them all.



Every customer who uses the Gem Circle should ask for a free sample of the new Royal Circle with next shipment.



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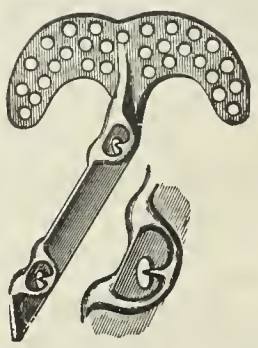

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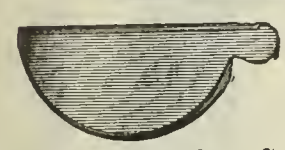

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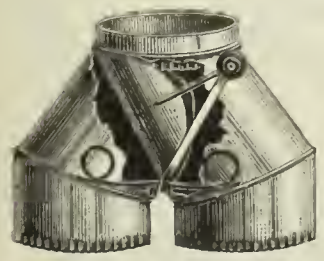

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RAIN WATER CUT-OFF.

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FOR PUTTING ON SHEET METAL ROOFING OR SIDING.

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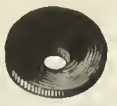

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They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job. Liberal discount to the Hardware and Roofing Trade. Send for circulars and prices. **LITTLEFORD BROS.,** Sole Mfrs., 453, 455 & 457 E. Pearl St. Cincinnati, O.

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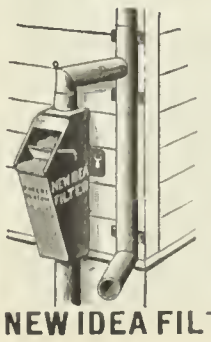

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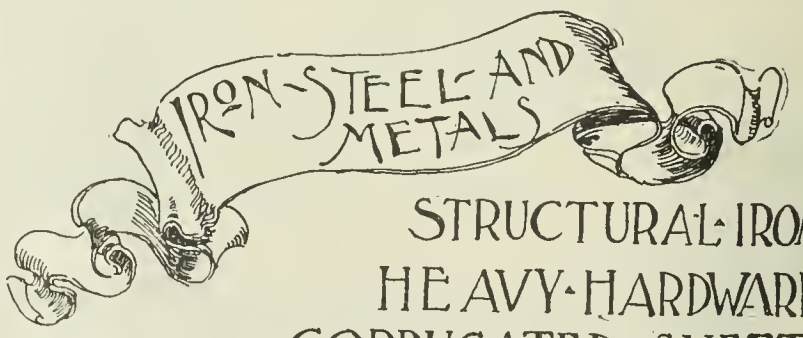

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HEAVY-HARDWARE
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COE-OLD-STYLE-ROOFING-PLATE

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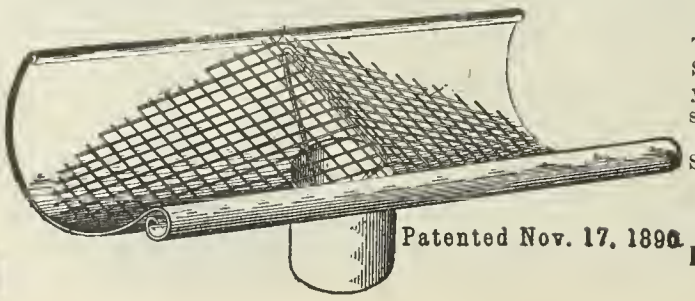

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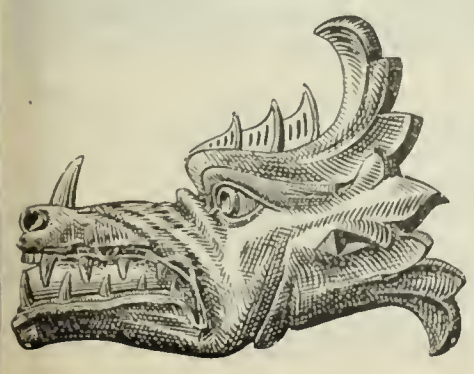

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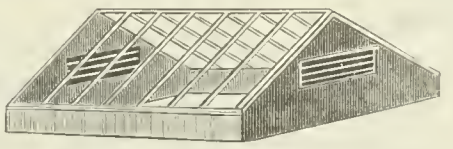

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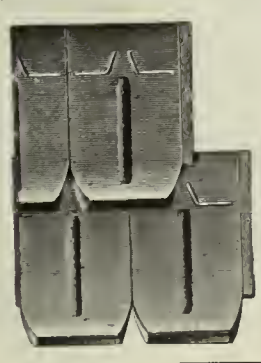

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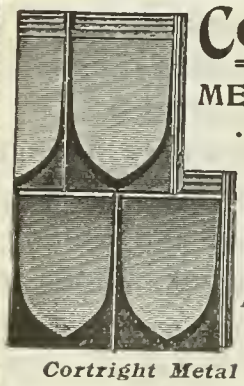

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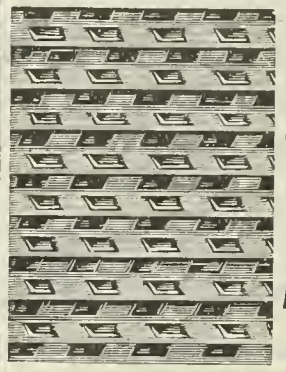

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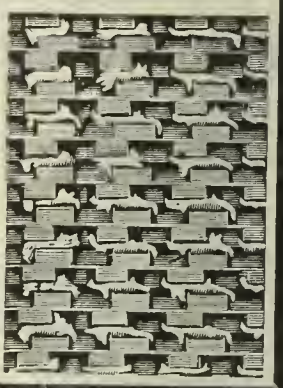

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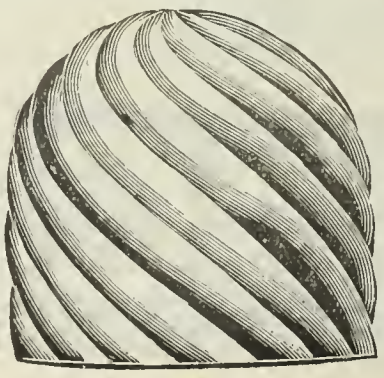

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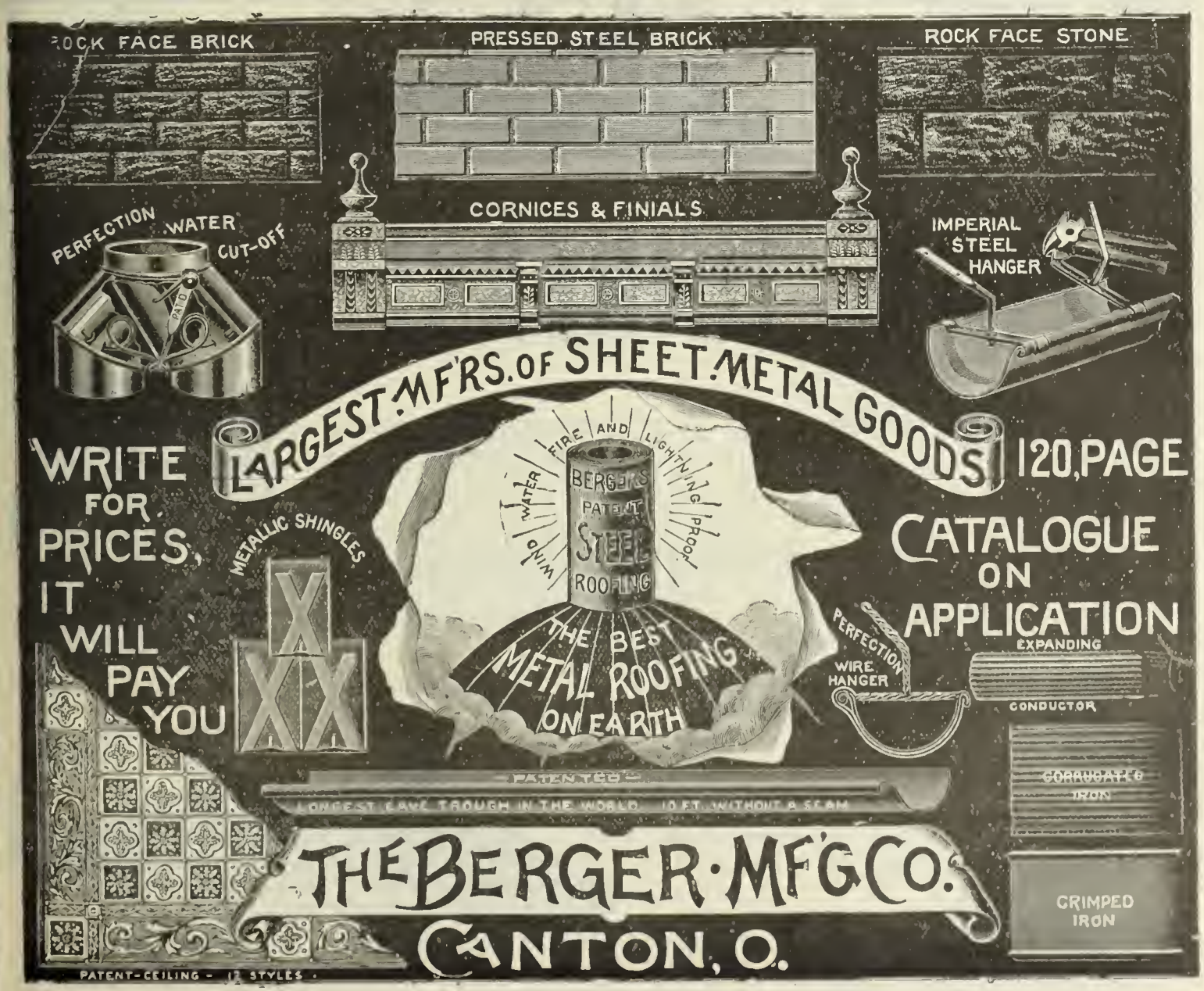

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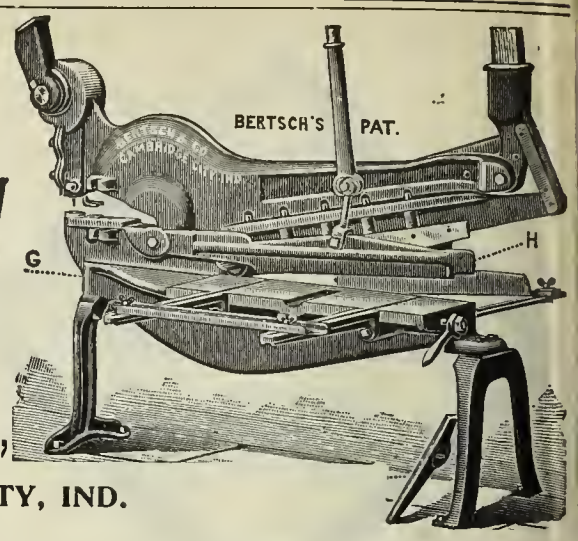

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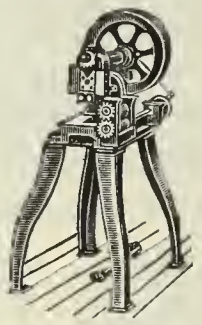

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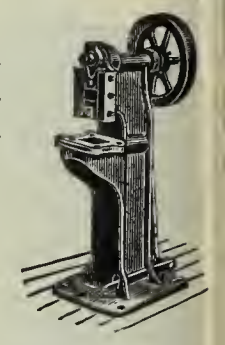

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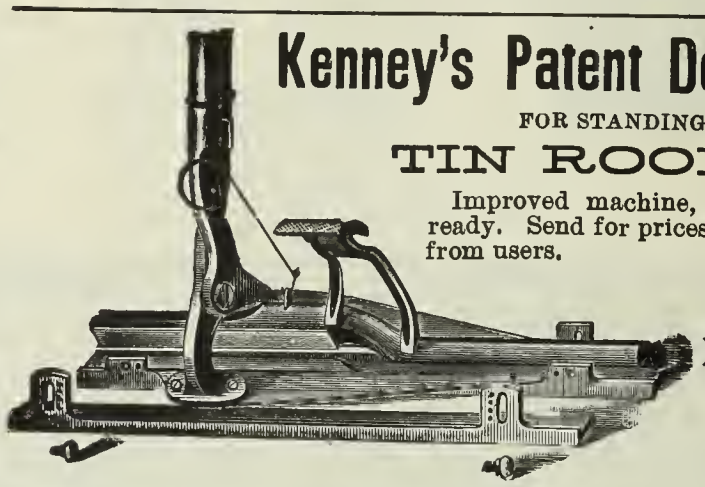

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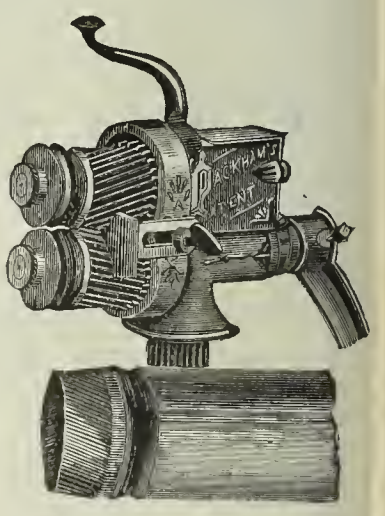

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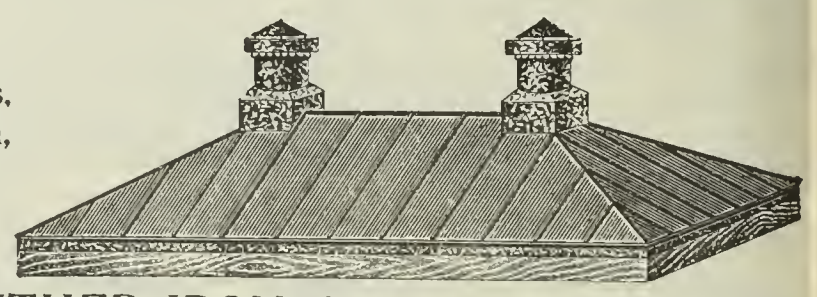

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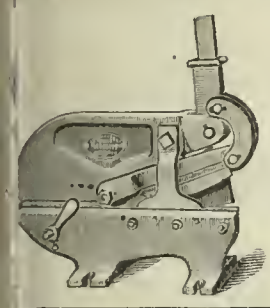

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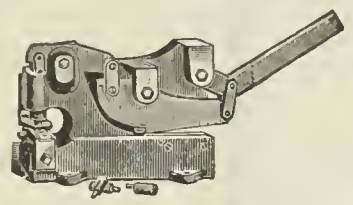

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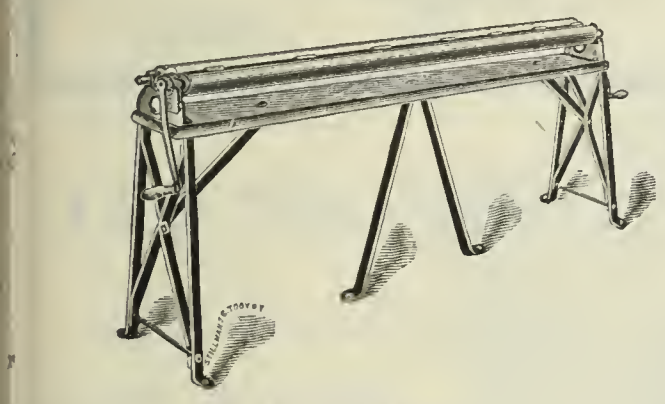

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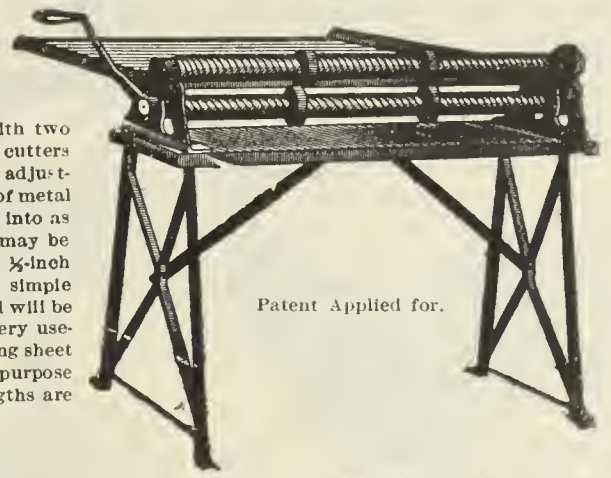

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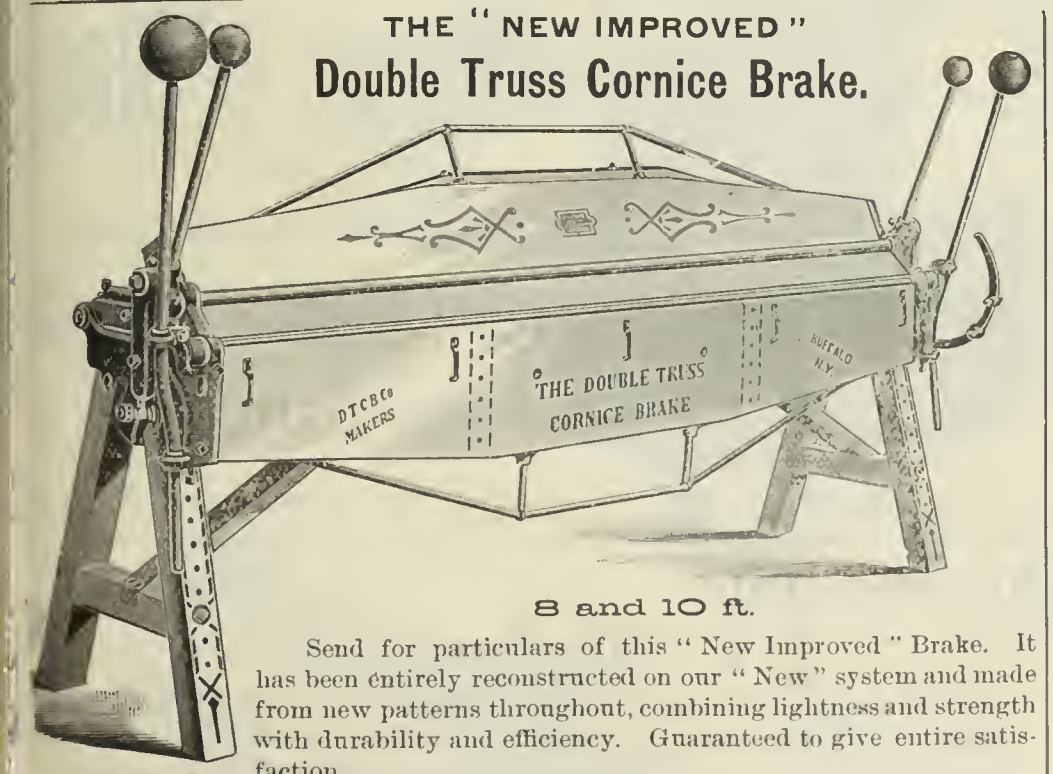

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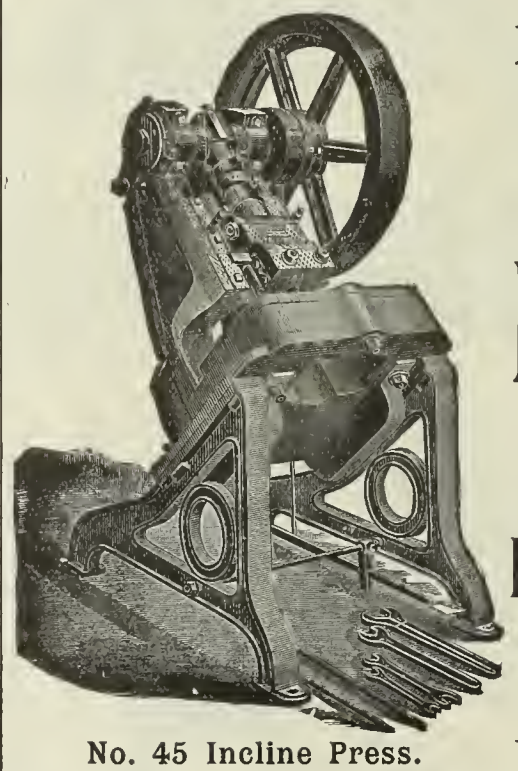

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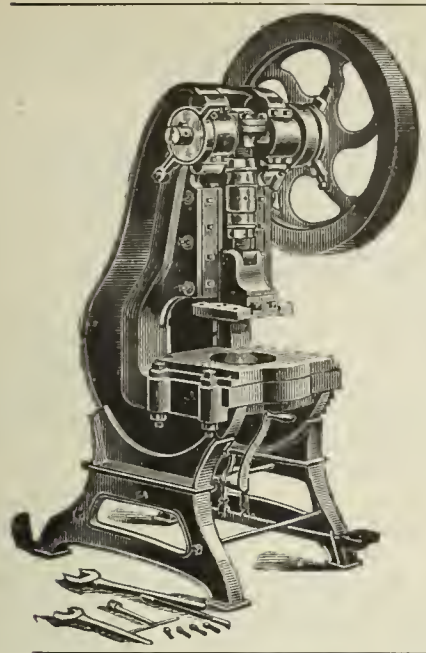

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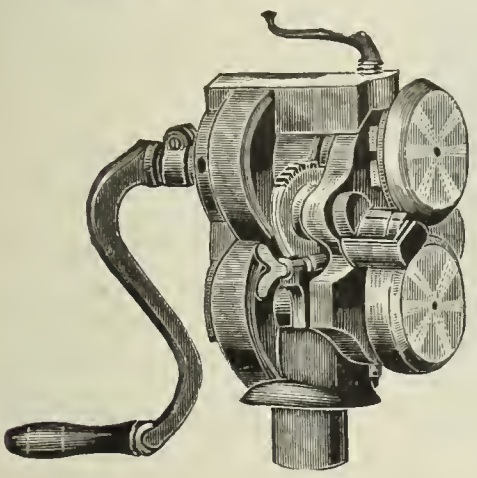

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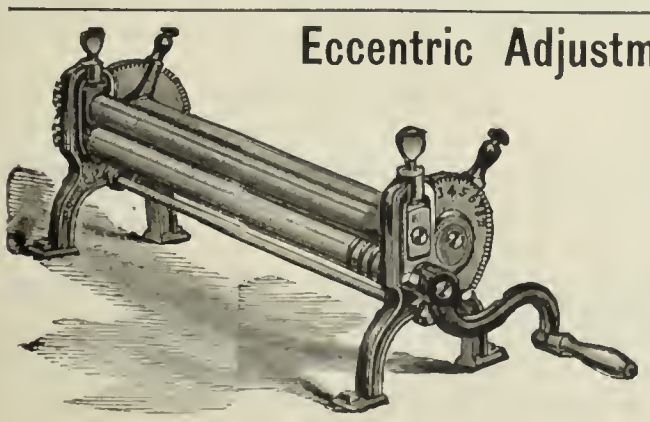

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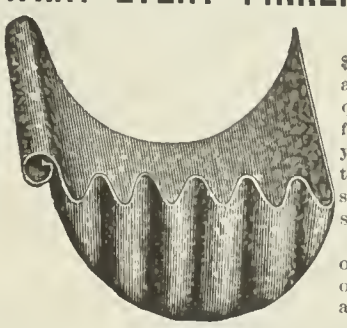

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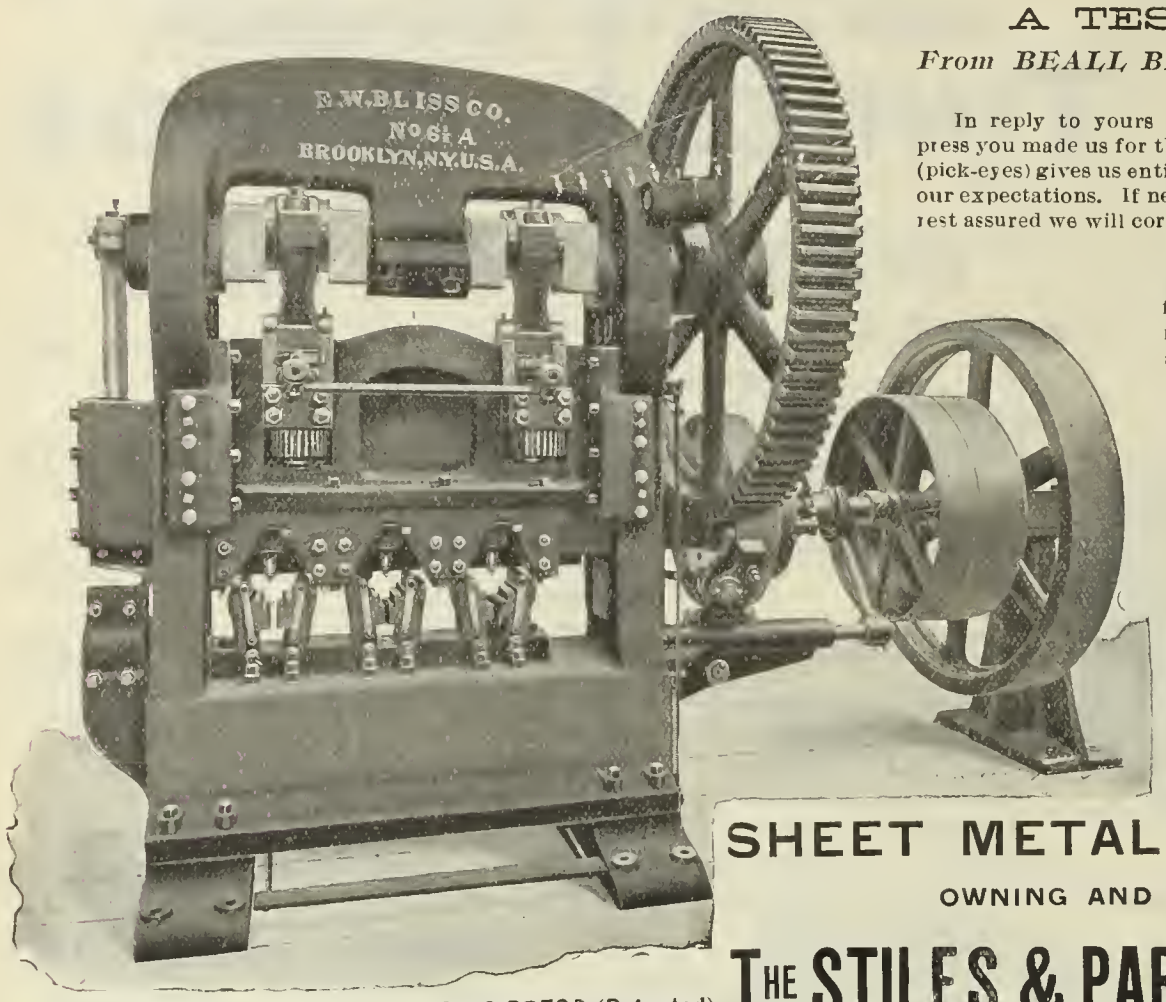

No. 6½A "BLISS" PICK-EYE FORGING PRESS (Patented)

A TESTIMONIAL.

From BEALL, BROS.

ALTON, ILL., April 10, 1896.

In reply to yours of 8th inst., will state that the large press you made us for the manufacture of goods in our line (pick-eyes) gives us entire satisfaction and more than meets our expectations. If needing anything in your line you can rest assured we will correspond with you.

MAY 1, 1896.

Our machine is working perfectly in every respect, and we are making from 1,200 to 2,000 pick-eyes a day, and it gives us no trouble whatever. We occasionally break a punch, but that can be changed in a few moments' time, as we have some made up, and all we have to do is to take out the old one and put in a new one.

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Mfd. by R. M. CLOUGH, New Haven, Conn.

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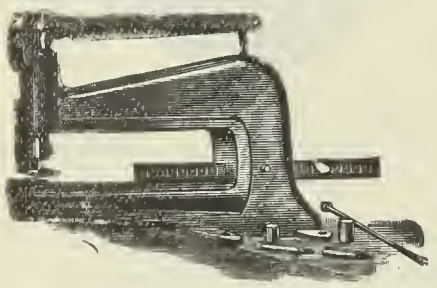

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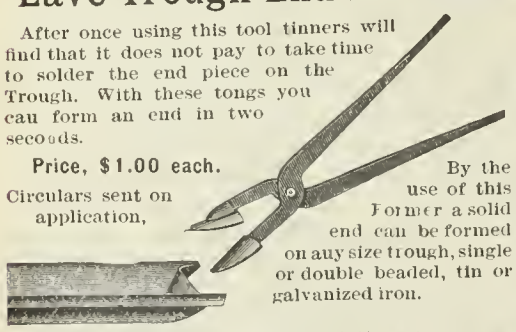
NEW PROCESS

Eave Trough End Former.

After once using this tool tinners will find that it does not pay to take time to solder the end piece on the Trough. With these tongs you can form an end in two seconds.

Price, $1.00 each.

Circulars sent on application,



By the use of this Former a solid end can be formed on any size trough, single or double beaded, tin or galvanized iron.

Ask your jobber for them, or send direct to

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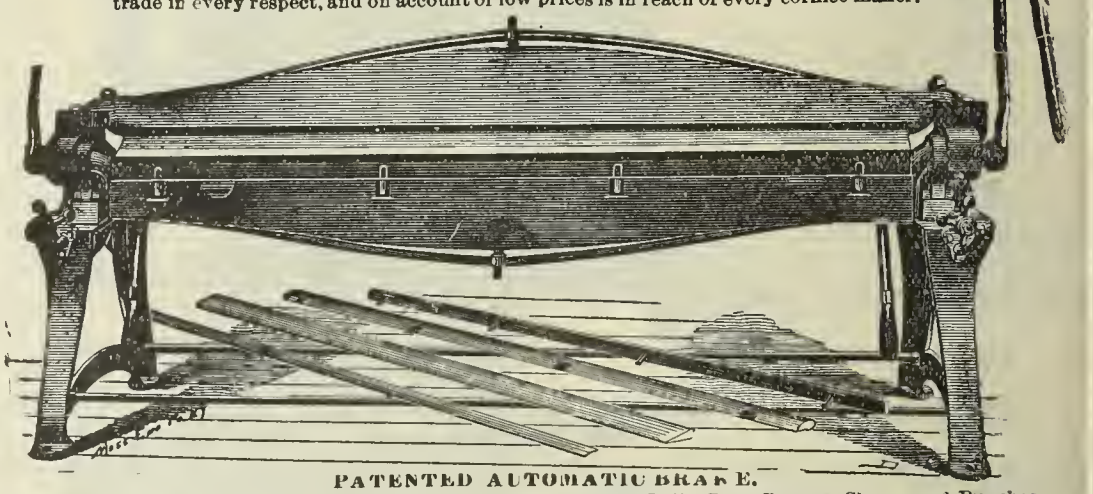

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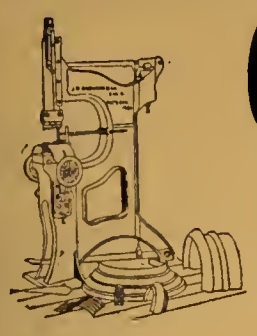

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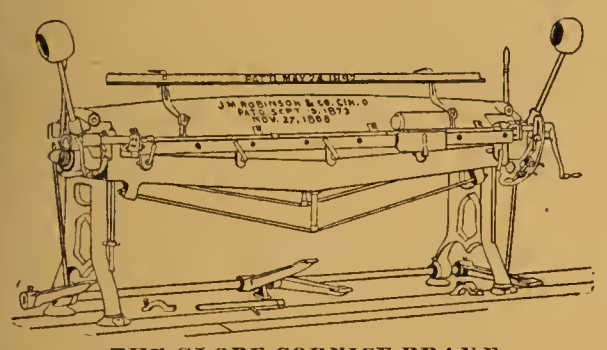

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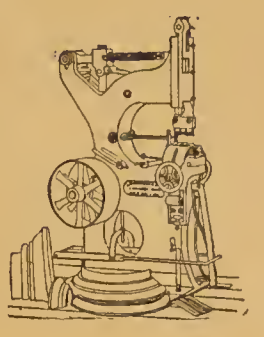

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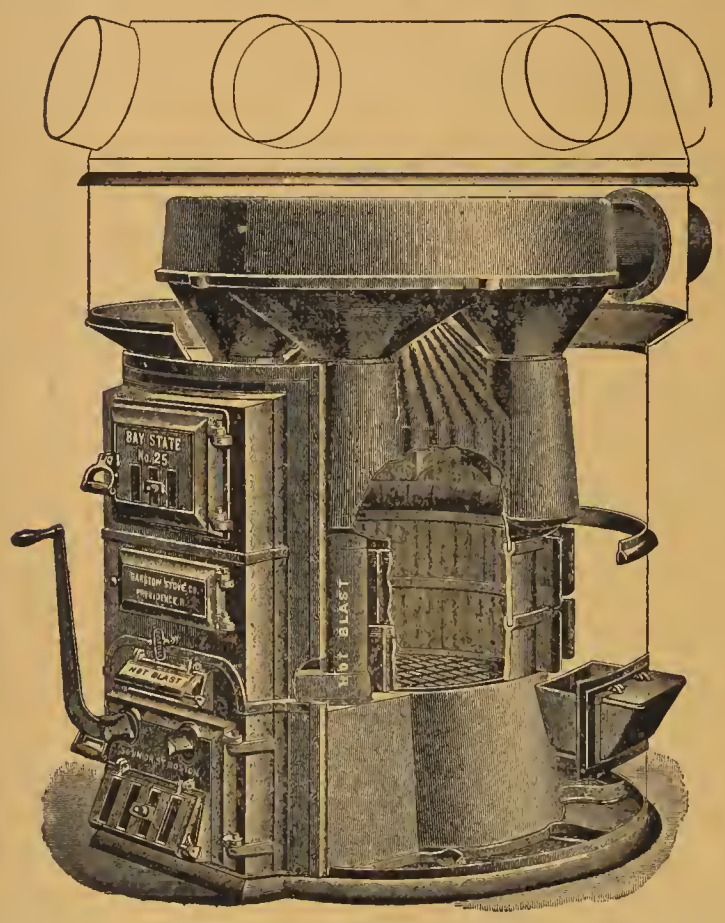

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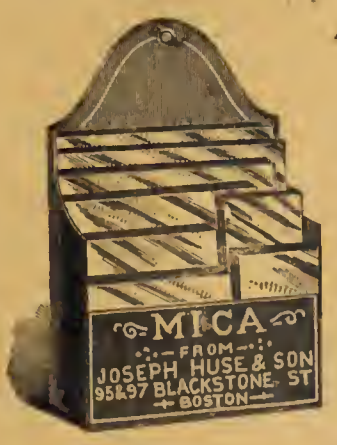

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advertisement on page 30 showing the Magee Boston Heater "A" series.

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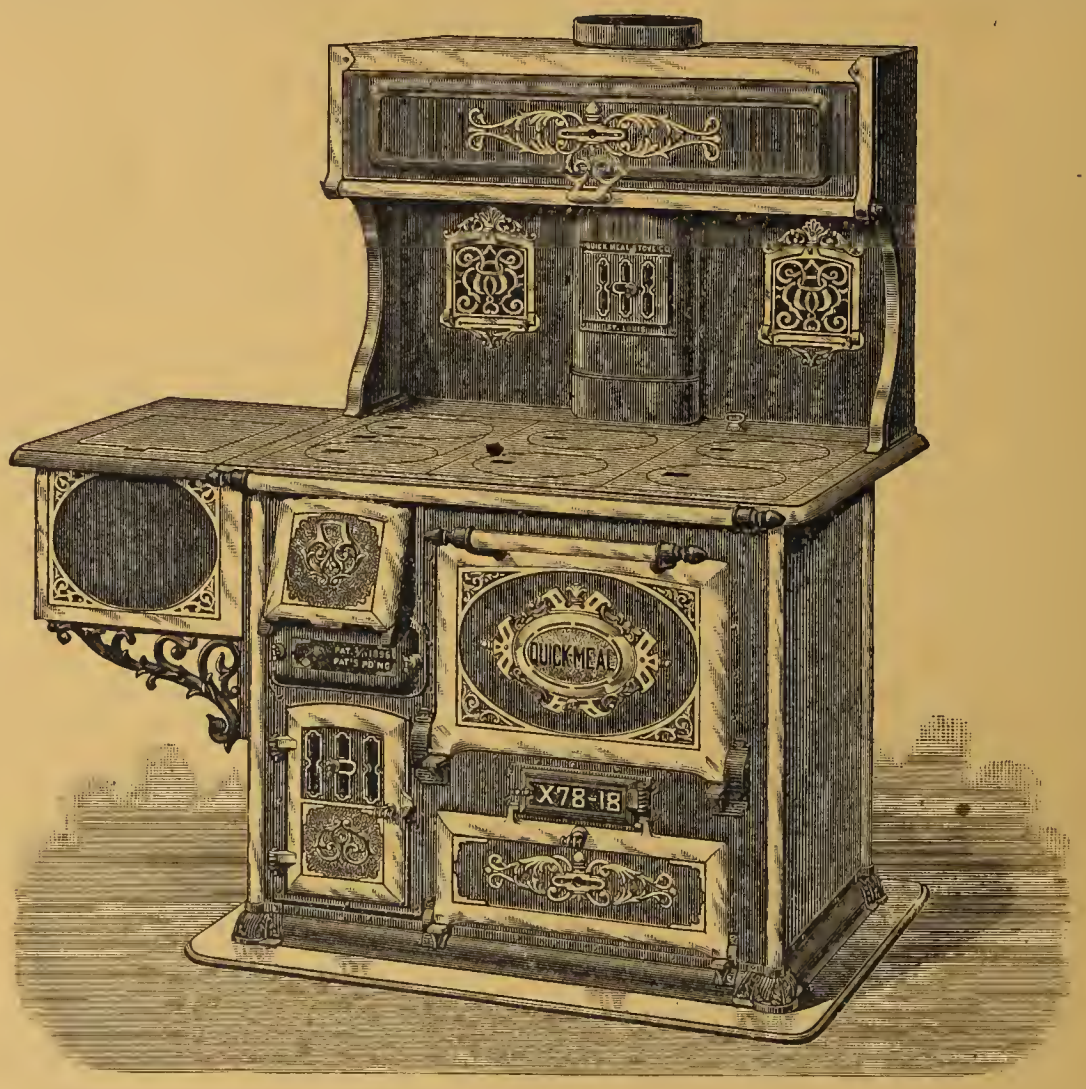
THE NAME TELLS THE STORY OF ITS CONVENIENCE.



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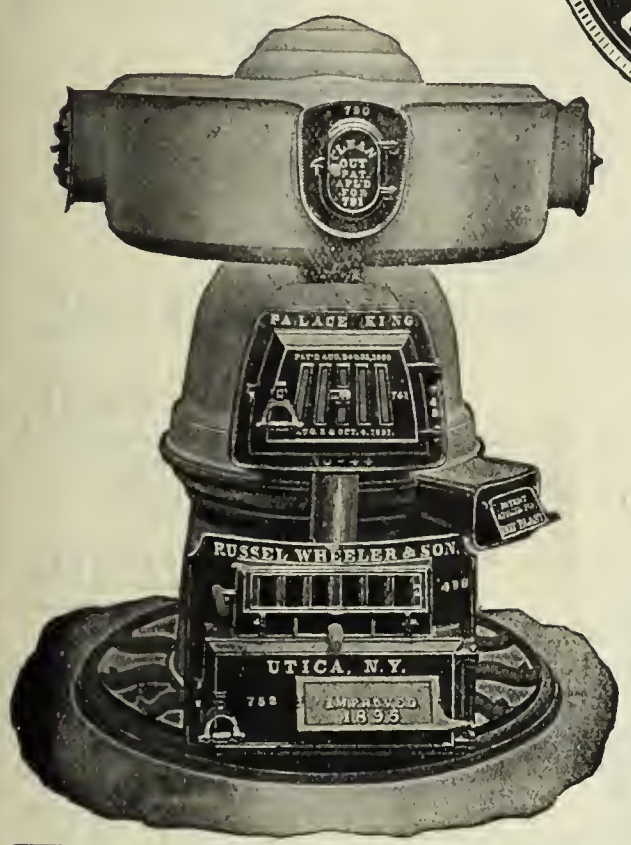

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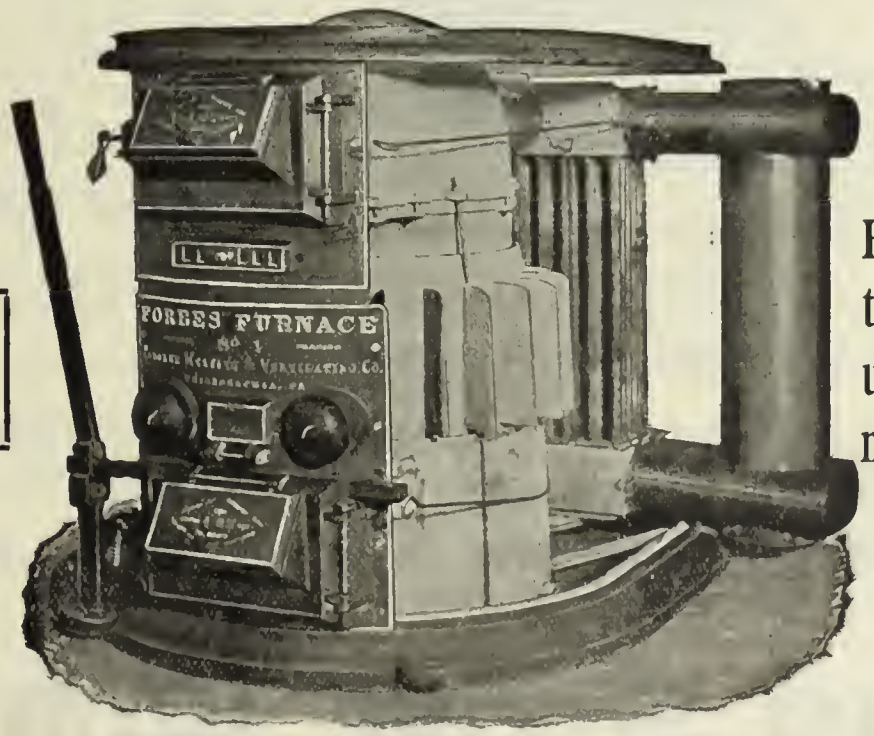

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A FEW of these stoves on your floor will convince your trade that you have goods up to the times in every respect. We make them in four sizes and two styles, and have a descriptive pamphlet ready to mail to you upon request.

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And it has no—"Ash Pan."

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It still leads the way—without an "ash pan" and provides—fame—and a—name—for—counterfeits—to trade upon—safely inside the law.

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1897

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Catalogue

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Don't run away with the idea that because *Acorns are better* than other goods they are higher in price. Find out about it. Tell us what goods you want prices on, and by return mail we will quote you some figures that will *get your business.*

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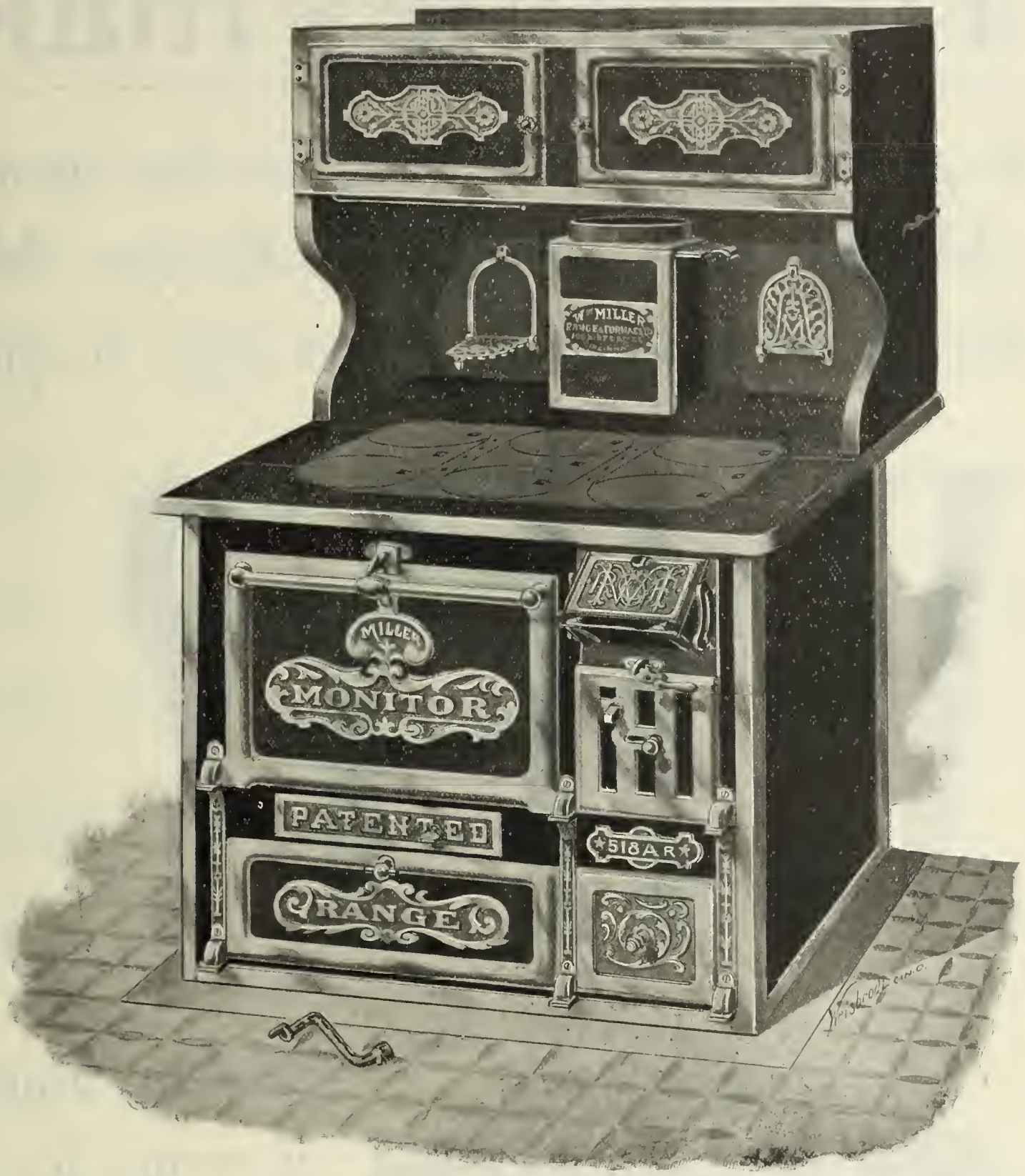

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...IN...

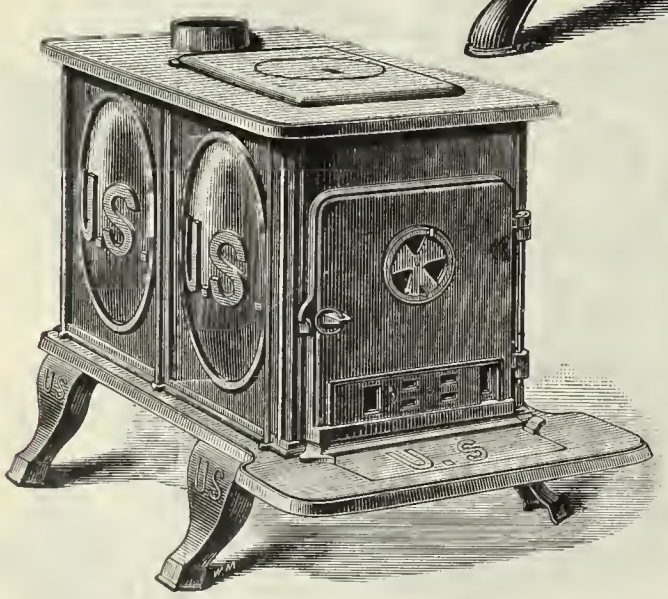
SIZE, WEIGHT, and HEATING CAPACITY.

Especially adapted for Halls, Shops, Depots, Warehouses, Churches, Large Stores, in fact for very Large Rooms of All Kinds . . . . . .

PLUTO.

FOR HARD OR SOFT COAL.

NUMBER, - -	80	90	100
Height of stove, - -	58	61	61
Diameter of grate, -	12	14	14
Diameter of fire-pot top,	21	23	25
Depth of ash-pit, -	12	12	12



U. S. ARMY BOX STOVES.
No, 36 Takes Three-Foot Wood.
No. 50 Takes Four-Foot Wood.

Takes Four-Foot Wood.

CHARTER OAK RANGES

Charter Oak Stove & Range Co.,

ST. LOUIS, MO.

CHARTER OAK STOVES

Monarch Blue Gas Flame Oil Heating Stove.

The phenomenal success of the "Blue Flame" Oil Burner of the past two years has created a "Macedonian Call" for a heater made on the same lines, and the "Monarch" steps forward to supply the demand. It has been on the market one year, and for the season of 1897-8 is presented with several important improvements which a year's experience has suggested and we offer it with all confidence in its efficiency, cleanliness, intense power and great comfort.

There are no others with Blue Flame.

Top tilts back to light the Burner or to remove the Tank. Mounted on Casters. The entire Stove is richly nickeled and beautifully polished. Brass Tank. Burner cannot creep up. Will not smoke or smell. There is only one "Blue Flame" Heater and that is the "Monarch."

WRITE FOR PRICES AND TERMS.

THE MONARCH STOVE CO.

MANSFIELD, O., U. S. A.

B. F. BLYMYER, Suc. to H. R. HAMILTON, 67 Lake St., Chicago, Agent for Ill. and Ind.
DANVILLE STOVE & MFG. CO., Danville, Pa., New York, N. Y., and Phila., Pa., Agents for Eastern States.

A DEALER'S KLONDIKE.

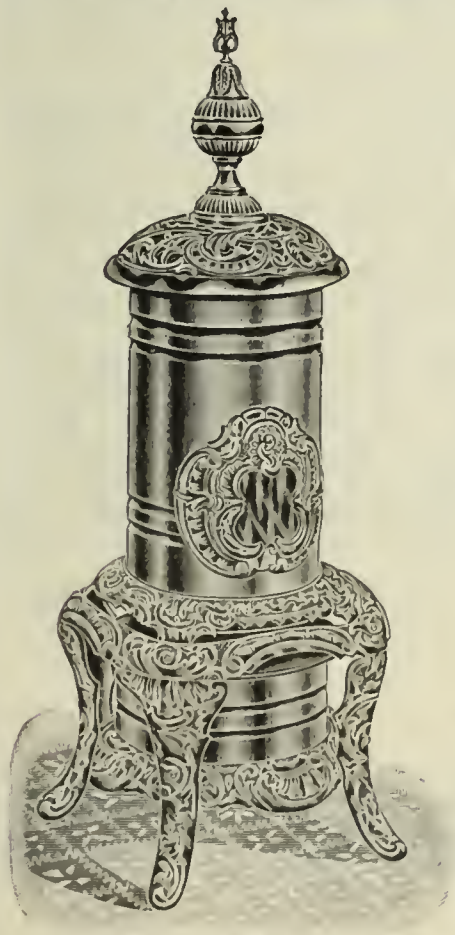
START A

GOLD MINE

OF YOUR OWN

By Handling

ELECTRIC OIL HEATERS.



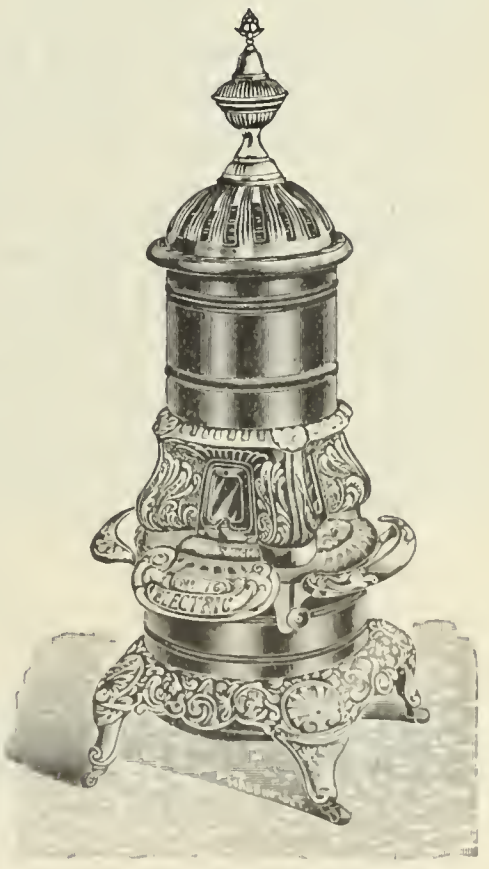
Made in 3 Styles.

Artistic Ornamentation.

We wish to call particular attention to the Air Circulation and Expansion, Radiation, etc., as involved in the construction of the **ELECTRIC**, as compared to the interior arrangement of certain oil heating **LAMPS** placed on the market under the misleading appellation of Oil Heating **STOVES**, illustrating the audacious assumption of the manufacturers in claiming such distinction.

The **ELECTRIC** has the **greatest radiating surface** and its **heating capacity** is greatly **increased** by the application of our **ventiduct principle**, involving **four hot air flues** which take up the cold air from the floor and pass it through the stove and out at the top, heated to a high degree.

Graceful and Symmetrical in the Highest Degree.



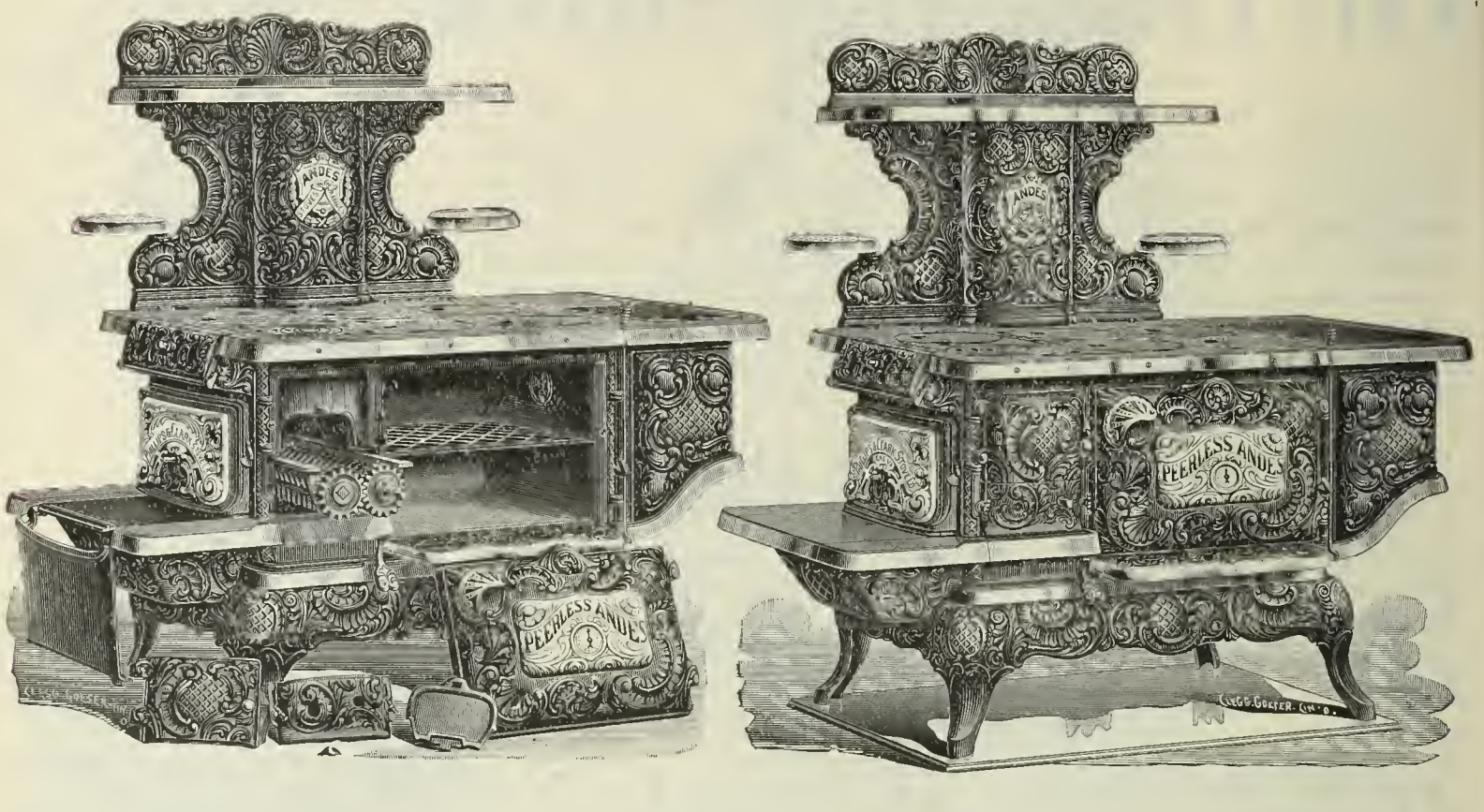
Made in 2 Sizes.

Perfect Proportions.

Send for Catalog and Discounts of the most complete line of Oil Stoves manufactured.

ELECTRIC OIL STOVE CO., - - HOMER MICH.

Peerless Andes.



Entirely New. *Finest Range Ever Made.*

WE present the latest addition to the ANDES line of Stoves and Ranges. As will be noticed from the above cut, the design is bold, up to date, and strictly correct, artistically considered. This range is unusually large in every way. It has every improvement which is at all desirable. The oven is very large and well ventilated; heated on five sides The ash pan is unusually large. The fire box is a new and improved form, perfect in its fittings. The grate is of our own improved style of draw out form, together with our own patent arrangement for taking out the single bars without removing the fire box. The entire grate can be drawn out without removing the fire box. The wood fixtures for this range we claim to be better than any heretofore made. The reservoir is unusually large. The oven door, as is shown in the above cut, has the best form of oven thermometer made. The top oven plate is cemented. The bottom of the stove is double. The back of the oven is double. An elegant nickel band on the edge of the main top, and also on the edge of the high shelf. Reed's patent check damper. Towel rod. Elegant plate panels. In every respect this range is as good in design, form, weight, quality of castings and mounting as can possibly be made. We predict for this range a successful sale. The prices will be right. The No. 9-20 size is now ready.

MANUFACTURED BY

Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

Oak Andes.

MADE IN FIVE SIZES.

WE present above a cut of the OAK ANDES for 1897. As will be seen, it is entirely different in design from any other, and in construction it is entirely original. The sale of this stove for the year 1896 exceeded by far the most sanguine expectations of the manufacturers, and it is predicted that it will be one of the most, if not the most satisfactory selling stove on the market the present year. It is peculiar in that it has a distinctively original jointless air tight bottom, entirely different from any other, and for which letters patent are pending. It is claimed to be the strongest Oak Stove bottom on the market. The register damper used in this stove is on the inside, making a much better finish on the exterior than if otherwise. The damper is ground in emery by day labor, thus insuring a perfectly air tight joint. It is unquestionably the best air tight damper made. The fire pots in the OAK ANDES are heavier than any other, thus making the stove more durable. We use the best quality of No. 14 Steel in the bodies. The grates, both wood and coal, are the most approved form; the coal grate being the thoroughly tested draw center pattern, the wood grate being the register pattern. The dealer who wishes to handle the very best stove on the market, and at prices suited to the times, should make application for the sale of the OAK ANDES.

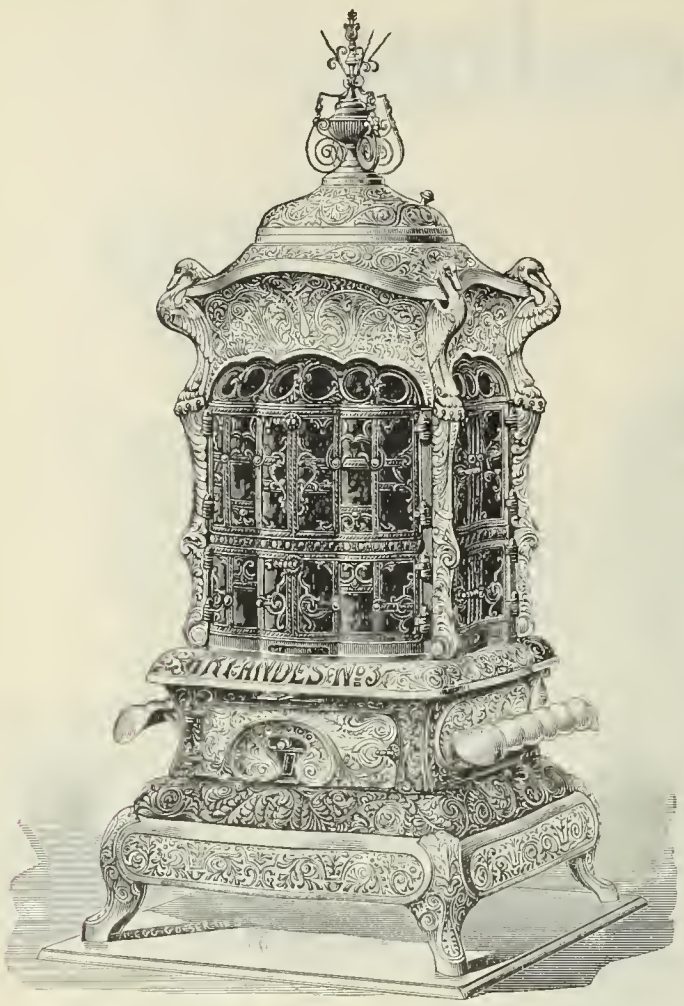
MANUFACTURED BY

Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

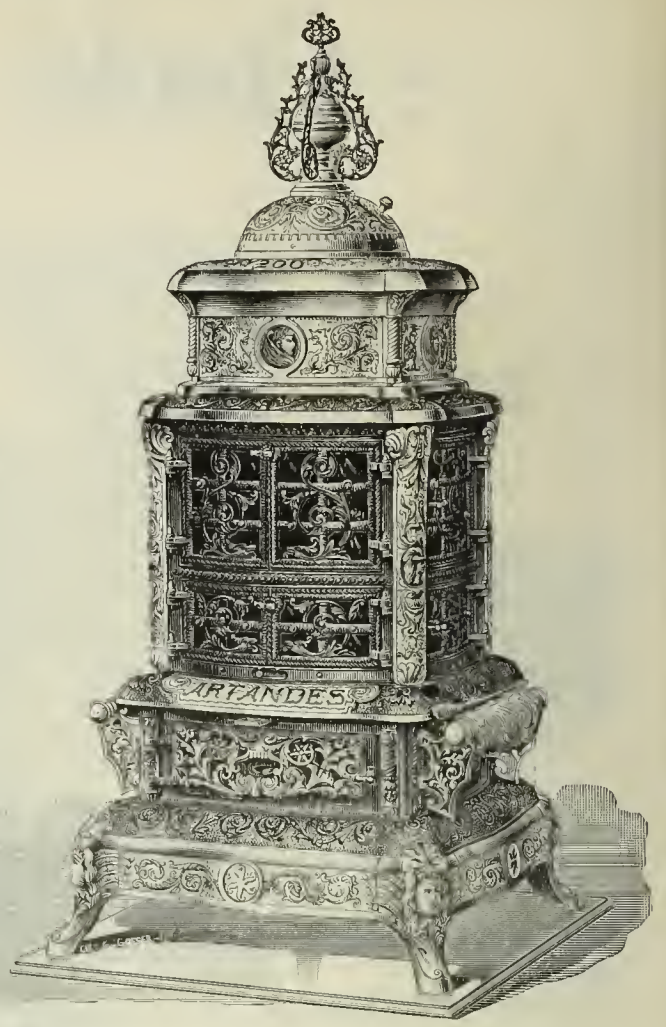
WESTERN BRANCH:
135 Lake Street, Chicago, Ill.



Art Andes.

TWO SIZES.

No. 2. Size of fire-pot 14 inches.
No. 3. " " 16 "



Art Andes.

THREE SIZES.

No. 180, Size of fire-pot 14½ inches.
No. 200, " " 16 "
No. 22, " " 17½ "

WE BELIEVE it is generally conceded that no better first class Parlor Heating Stoves have ever been made than the **Art Andes,** two styles of which are shown above. No question but that there is more satisfaction to the dealer as well as to the consumer in selling and using the best article. The quality is unquestioned; the design is attractive, and in good taste, and the operation has always been entirely satisfactory to the consumer. We would recommend these goods in preference to cheaper ones; more satisfaction in handling and using them.

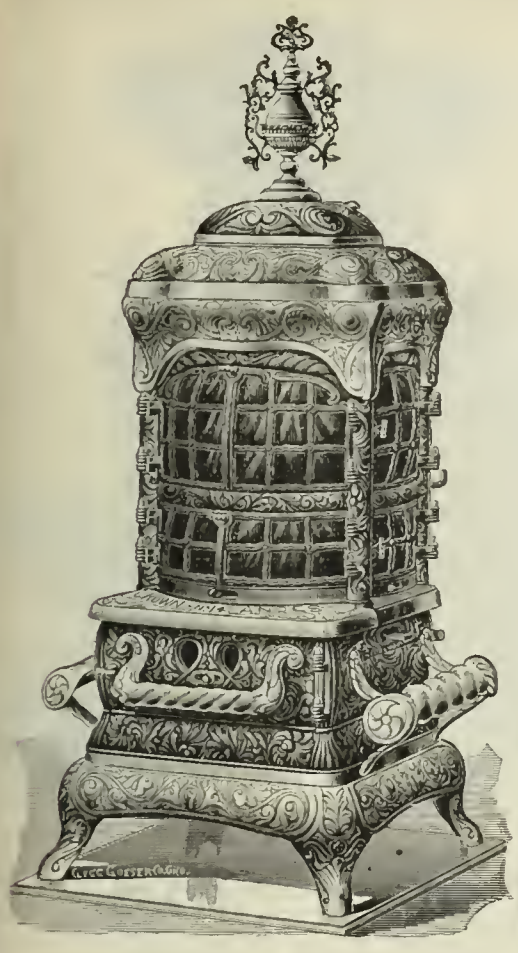
MANUFACTURED BY

Phillips & Clark Stove Co.,

Geneva, New York.

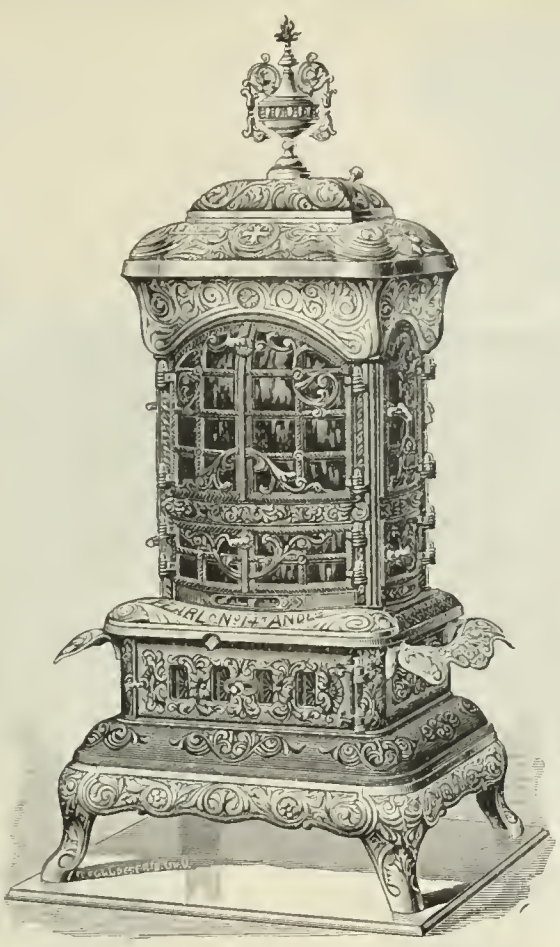
EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.



Crown Andes.

No. **14,** Size of fire pot, 14 inches.
No. **16,** " " 16 "



Pearl Andes.

No. **14,** Size of fire-pot, 14 inches.
No. **16,** " " 16 "

Magic Andes.

No. **11,** Size of fire-pot, 11 inches.
No. **13,** " " 12½ "
No. **15,** " " 14 "

ABOVE are shown a few of the medium and lower grade **Andes Heating Stoves.** Other varieties are manufactured, but these cover all the requirements of any market. Every **Andes** stove is a perfect article: they are all made of the same material, the best that can be purchased. Every piece of casting is thoroughly inspected, and no smoother stoves are made than those bearing the name "**Andes.**" The quality of the mounting is first class, as good as the best mechanics can produce. The designs, it will be observed, are carefully looked after in the cheaper grade of "**Andes**" as well as in the higher, and the operation of these stoves is all that can be desired. The dealer wishing the most satisfactory line of goods to sell can find such in the "**Andes**" to better advantage than in any other line of stoves and ranges made.

MANUFACTURED BY

Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

Grand Andes.

NICKEL EDGE WHEN DESIRED.

SIX-HOLE. For Hard or Soft Coal or Wood.

No. **8-18,** 8-in. holes, Oven 18 x 19 inches.
No. **8-20,** 8-in. " " 20 x 21 "
No. **9-20,** 9-in. " " 20 x 21 "

Right Grand Andes.

NICKEL EDGE WHEN DESIRED.

SIX-HOLE. For Hard or Soft Coal or Wood.

No. **8-20,** 8-in. holes, Oven 20 x 21 inches.
No. **9-20,** 9-in. " " 20 x 21 "

THE ranges bearing the name "**Andes**" have the enviable distinction of carrying off the palm for performing the greatest baking feat ever accomplished. There is no better baker than the **Grand Andes.** Any who are acquainted with this range will acknowledge that it is unquestionably as neat and attractive a design as ever presented; that it is a perfectly proportioned range; that it is made of selected castings as smooth as can be made in iron. The mounting is first class and the operation has always been perfectly satisfactory to the consumer. There is nothing in the **Grand Andes** but that is strictly first class, and we claim that at the price this is the cheapest range on the market.

MANUFACTURED BY

Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

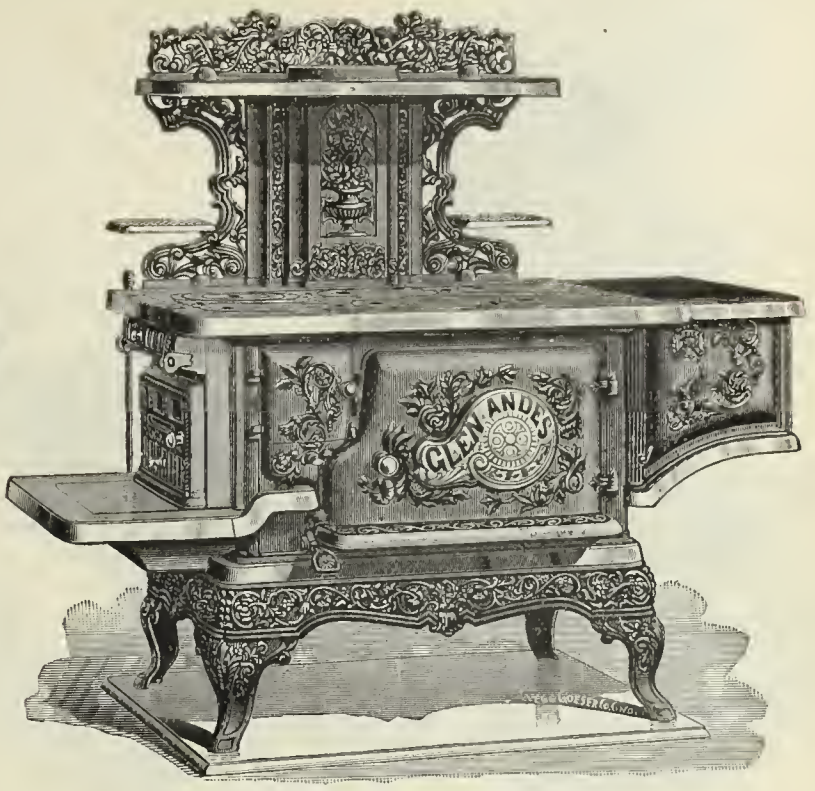
WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

Royal Andes.

NICKEL EDGE ON TOP, WHEN DESIRED.

SIX-HOLE. For Any Kind of Fuel.

No. **8-18,** 8-in. holes, Oven 18 x 18 inches.
No. **8-20,** 8-in. " " 20 x 20 "
No. **9-20,** 9-in. " " 20 x 20 "



Glen Andes.

SIX-HOLE. For Any Kind of Fuel.

No. **8-18,** 8-in. holes, Oven 18½ x 19½ inches.
No. **8-20,** 8-in. " " 20 x 21 "
No. **9-20,** 9 in. " " 20 x 21 "

THE above six-hole ranges, together with those of higher price, make up a line of six-hole ranges under the name of "**Andes**" which will meet all requirements. They are all attractive in appearance; all made with care; all perfect workers, and every one will give perfect satisfaction. The range of price will enable the dealer to meet all demands on him. There is nothing lacking in the "**Andes**" line to suit the most particular buyer.

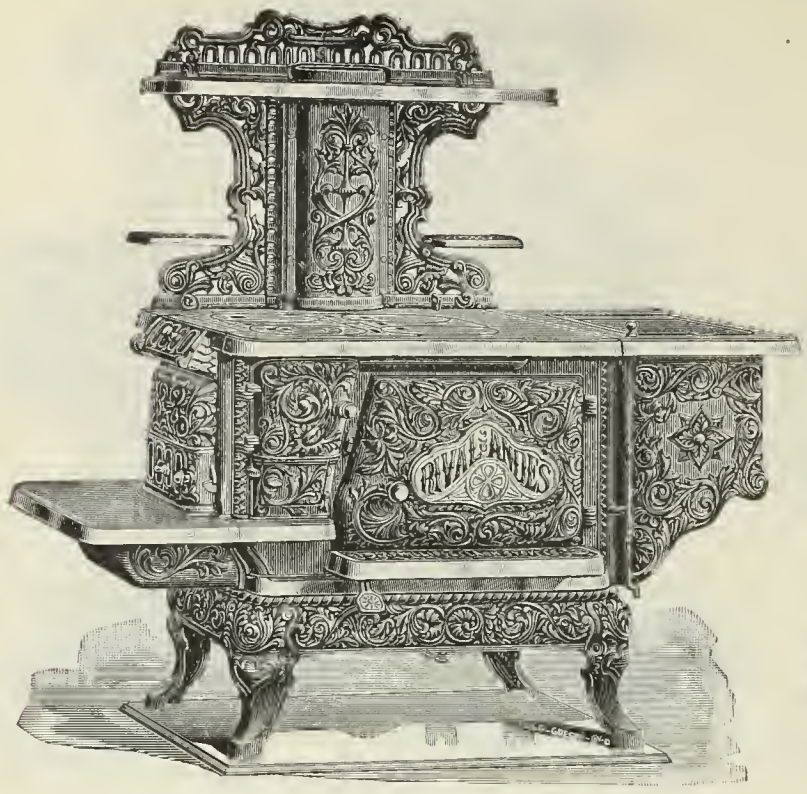
MANUFACTURED BY

Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

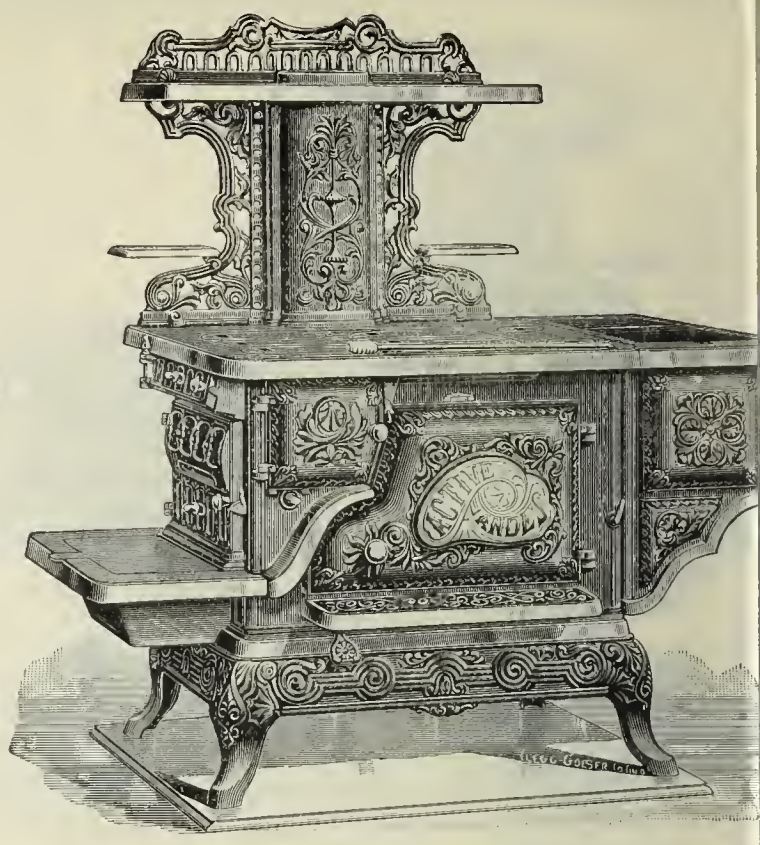


Rival Andes.

NICKEL EDGE ON TOP, WHEN DESIRED.

FOUR-HOLE. For Any Kind of Fuel.

No. **8-18,** 8-in. holes, Oven 18 x 18 inches.
No. **9-18,** 9-in. " " 18 x 18 "
No. **9-20,** 9-in. " " 20 x 20 "



Active Andes.

FOUR-HOLE.

Patent Shelf Fastening. For Any Kind of Fuel.

No. **8-18,** 8-in. holes, Oven 17 x 18 inches.
No. **8-20,** 8-in. " " 19 x 20 "
No. **9-20,** 9-in. " " 19 x 20 "

FOUR-hole ranges have demanded of the manufacturers more care and attention than heretofore, and we herewith on this and the following page present a line of **Four-Hole Ranges** which for style, design, quality, size, and price cannot be excelled. They range from the very best grade to the cheapest, although we claim that the "**Active Andes,**" which is our lowest priced range, is the best range ever offered to the trade at the same price; there is nothing cheap about it except the price. These ranges will do just as much work as the larger and more expensive goods, and the quality of these four-hole ranges is first class and will sustain the high standing of every article heretofore made and bearing the name "**Andes.**"

MANUFACTURED BY

Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

Lake Andes.

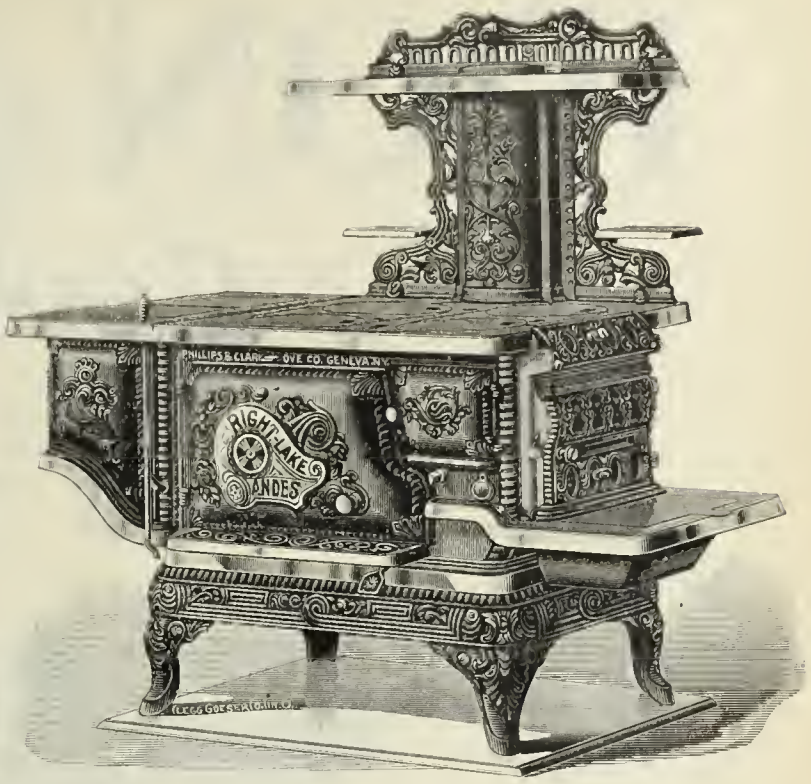
PLATED EDGE, WHEN DESIRED.

FOUR-HOLE.

WITH PATENT SHELF FASTENING.

For Any Kind of Fuel.

No. **8-18,** 8-in. holes, Oven 18 x 18 inches.
No. **9-18,** 9-in. " " 18 x 18 "
No. **8-20,** 8-in. " " 20 x 20 "
No. **9-20,** 9-in. " " 20 x 20 "



Right Lake Andes.

PLATED EDGE, WHEN DESIRED.

FOUR-HOLE.

WITH PATENT SHELF FASTENING.

For Any Kind of Fuel.

No. **8-20,** 8-in. holes, Oven 20 x 20 inches.
No. **9-20,** 9-in. " " 20 x 20 "

MANY wonder what has made the "**Andes**" goods so widely known, extensively sold, and so universally popular, and it can be briefly stated that, first, the quality of the goods; second, good value at a reasonable price.

Our agents are presenting the merits of the "**Andes**" line to our regular customers, and will be pleased to call on any others out of the regular route. We solicit correspondence, and can assure the buying public that their requirements can be better met and their necessities better served by buying **Andes Stoves and Ranges** than any other.

MANUFACTURED BY

Phillips & Clark Stove Co.,

Geneva, New York.

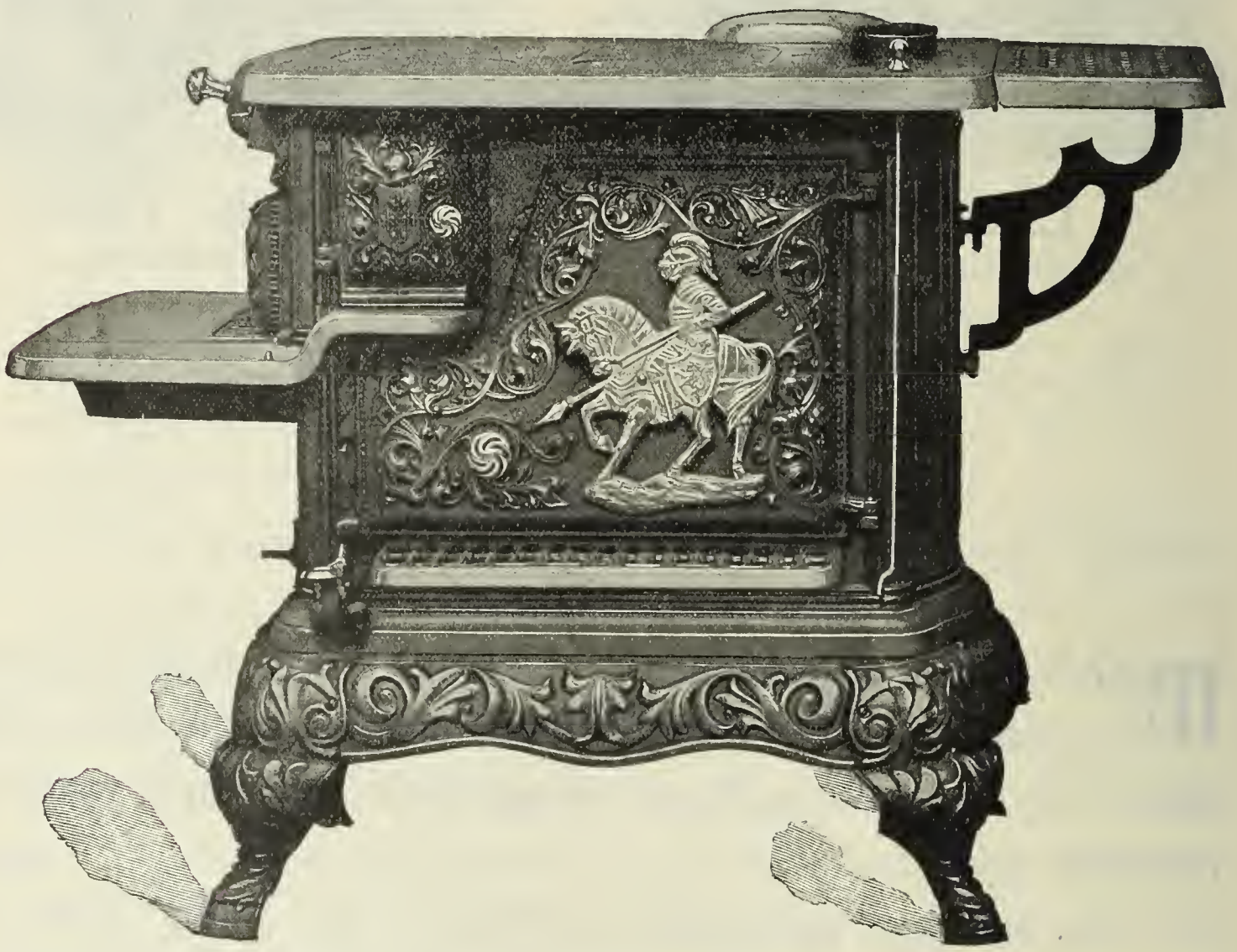
EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

IRON KING...

Cook Stoves

Lead in Popularity.



BECAUSE

They are Economizers of Fuel.
They are the Quickest Bakers on the Market.
Their Construction has been Kept up to the Requirements of the Times.
There are More in Use than Any Others.
They are never Allowed to get Old Fashioned.
They are Adapted to all Sections.

CHARLES NOBLE

LIBERTY STOVE WORK

Advance Note

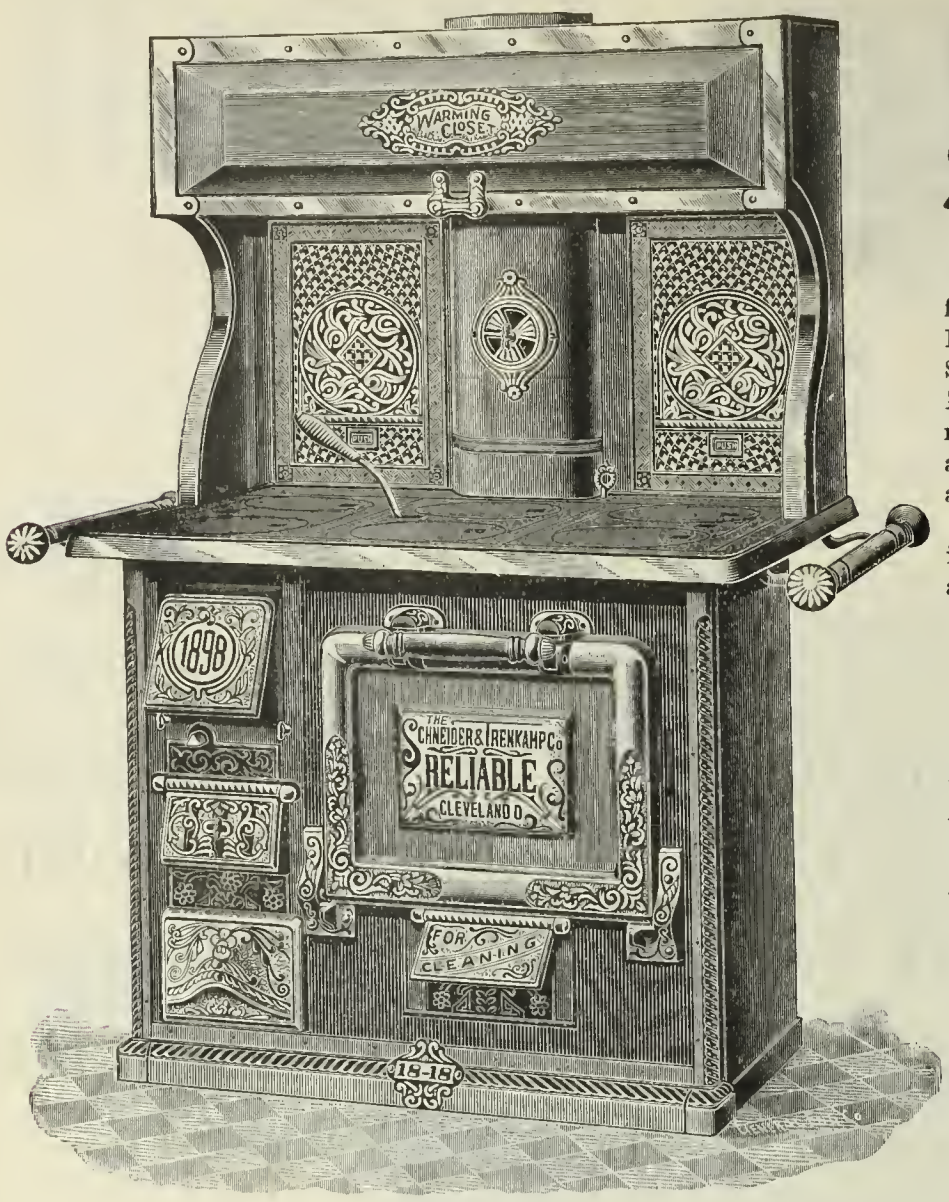
The opposite page shows our IRON KING cook stove as improved this season. Our determination to keep this stove ahead of all others has led us to again make some improvements in its design and construction. We are now finishing the patterns for an entire new line of

Iron King Stoves

We have not waited for engravings before making this announcement, but will have illustrated descriptive matter soon, which we shall be pleased to send when ready. Send us your name and address and we will send you particulars of this, the best selling line on the market.

& CO., Philadelphia.

, 239 Water St., New York.



Reliable Steel Ranges

Made in a Reliable Factory by Reliable Manufacturers known the world over for making only Reliable goods, and are handled by all Reliable Stove Dealers, are purchased by Reliable People. If you have a RELIABLE, your servant will be reliable, as it is a pleasure instead of a task to do all kinds of culinary work with a RELIABLE after using any other make of range.

There are a few other well made and well finished ranges on the market, "But not so many," and none of them equal the "RELIABLE."

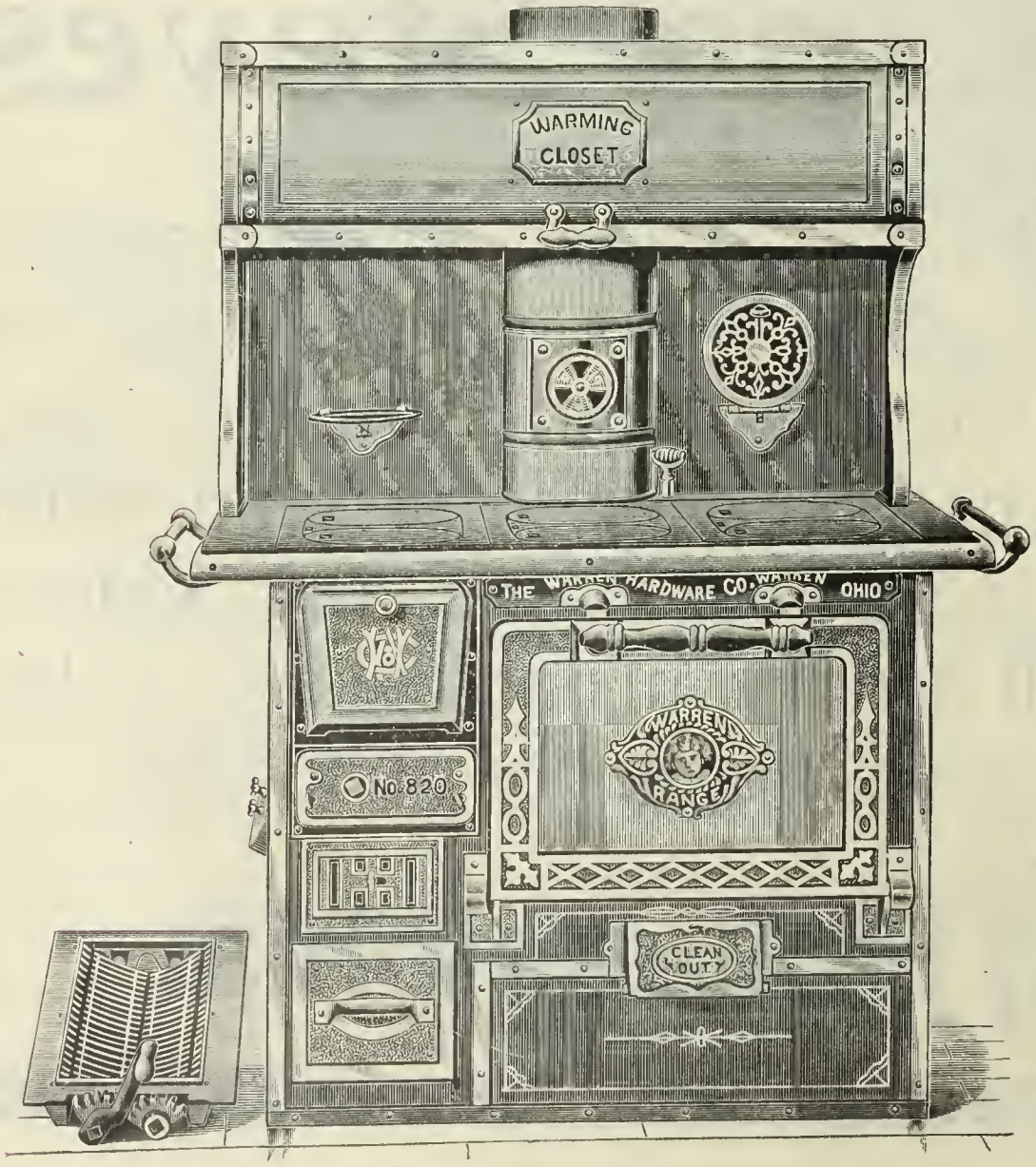
A FEW RELIABLE FACTS.

The Best Proportioned Range!
The Most Highly Finished Range!
A Range Constructed of the Highest Priced Patent Leveled Wrought Steel.
Our Fire Box Linings for 1898 are the heaviest placed in any range!
Our tops will never crack from heat!
The RELIABLE is the best made, costs more to make and is the most popular range of the day!
Also made in the combination style for coal, wood, manufactured and natural gas.
Send for catalogue.

MANUFACTURED BY

The Schneider & Trenkamp Co.,

CHICAGO, ILLINOIS.
CLEVELAND, OHIO.



Warren Steel Ranges.

Made in 16 Sizes.

126 Different Styles.

Substantially built. Heavy in construction. Elegantly finished and fully guaranteed. The line to handle, as they are strictly first-class and up to date. Get our prices, which will interest you. Write for catalogue, which will be gladly furnished.

Manufactured by the

Warren Hardware Co.

WARREN, OHIO.

W. D. SAGER, No. 54 N. Clinton St., Chicago, Ill., Wholesale Agent for Chicago, West and Northwest.

M. F. TALLMAGE, No. 82 Seneca St., Buffalo, N. Y., Wholesale Agent for Buffalo and vicinity.

DANVILLE STOVE & MFG. CO., Danville, Pa., Wholesale Agent for the East.
No. 284 Pearl St., New York, N. Y.
No. 107 N. 2nd St., Philadelphia, Pa.

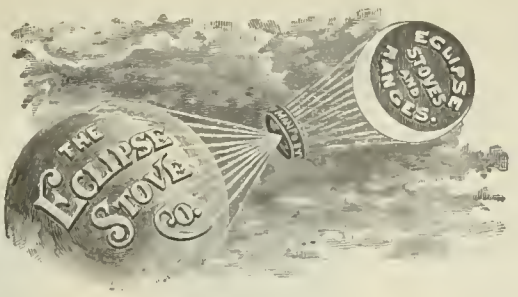
IF YOU ARE LOOKING FOR A

FIRST-CLASS COAL COOK,

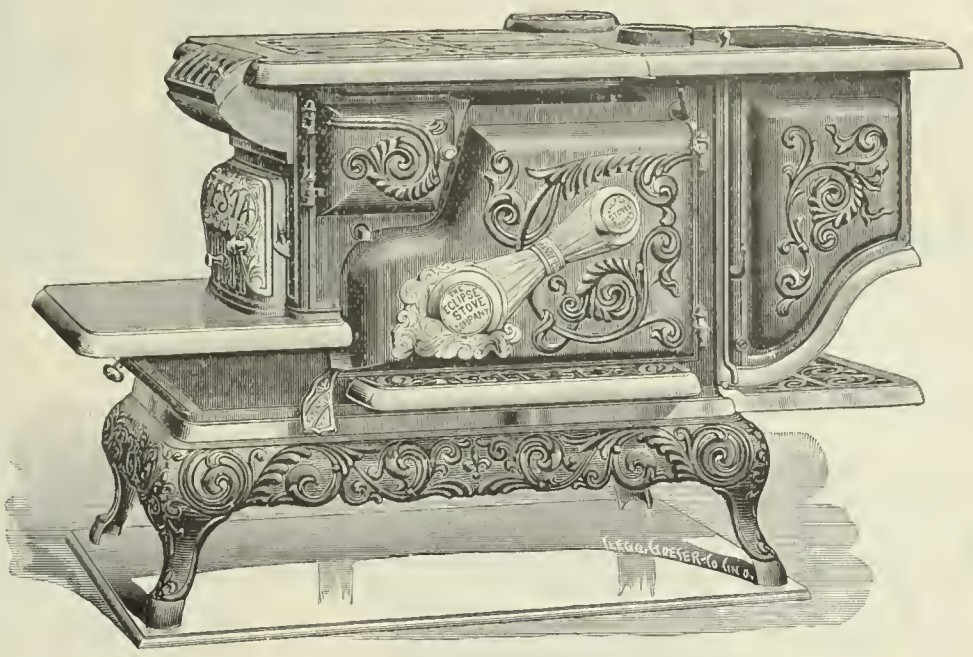
STRICTLY HIGH GRADE,
WELL MADE,
HEAVY and
FULLY WARRANTED,
SEEK NO LONGER,
FOR THE

Vesta Eclipse

meets these requirements in every particular.



IT WILL PAY YOU TO WRITE FOR OUR NEW CATALOGUES.



Size Ovens.	Tops.	Styles.
18 x 20	8 in.	Square Top.
20 x 22	9 in.	Brac. Res.

★ EVERY STOVE WARRANTED ★

A SAMPLE ORDER SOLICITED.

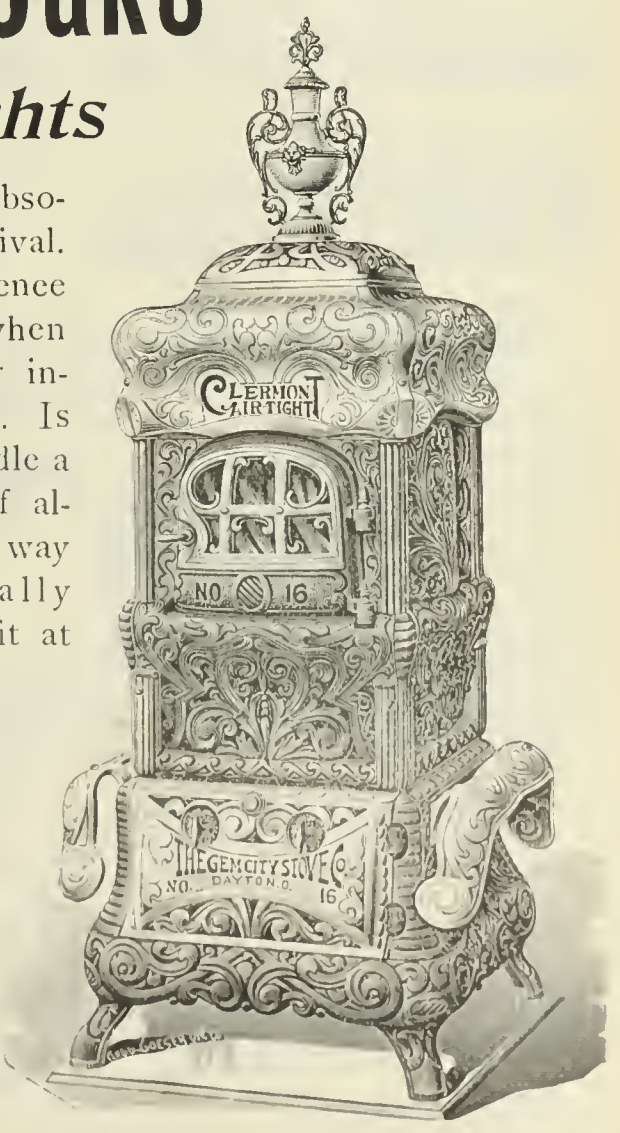
THE ECLIPSE STOVE CO., - Mansfield, Ohio.

Clermont Oaks

and Air Tights

as made by us are absolutely without a rival. Their points of excellence are so manifest that when exhibited the dealer invariably makes a sale. Is it not better to handle a stove that sells itself almost and is in every way satisfactory, especially when you can sell it at the same price as inferior productions? Our complete line is a good one to tie to. Write

The Gem City Stove Co.,
DAYTON, OHIO,
To-day.



MILLER OIL HEATERS.

See our Catalogue
No. 57.

It shows a large line of handsome designs, latest improvements and high quality.

PRICES RIGHT.

ALSO

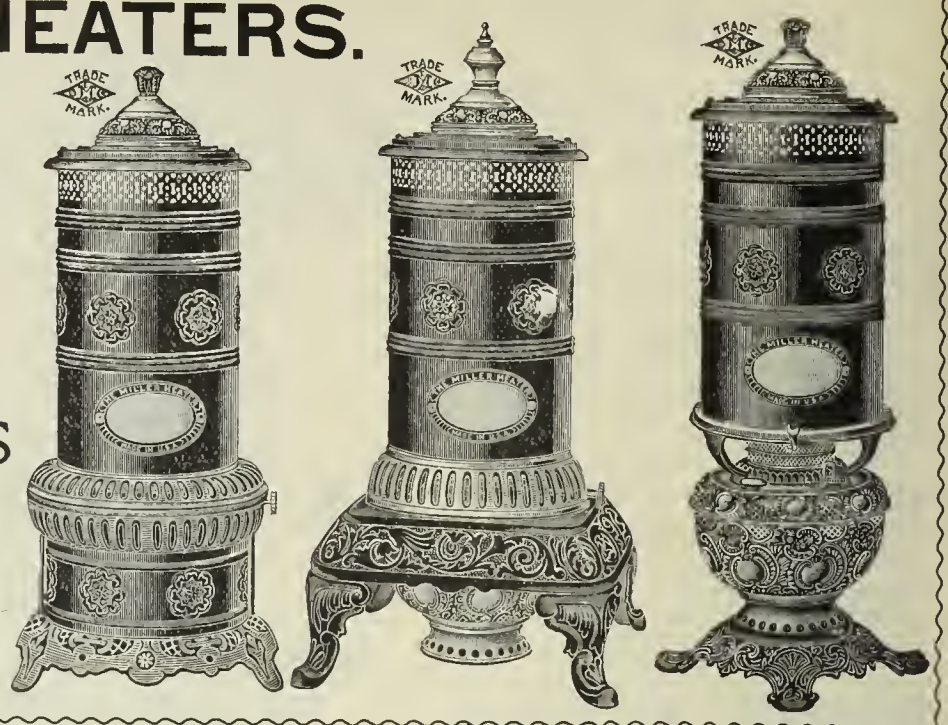
THE MILLER LAMPS

IN CATALOGUE No. 47.

EDWARD MILLER & COMPANY,

Factories and General Office, Meriden, Conn.

Stores: { 63 Pearl St., Boston, Mass., and 28-30 West Broadway, New York.



Richmond RANGES

THE DEALER

Wishing to Supply only the Best should Acquaint Himself with

THESE PRODUCTIONS.

ECONOMICAL,
DURABLE AND EFFICIENT.

A REPUTATION OF THIRTY YEARS

RICHMOND STOVE CO., NORWICH, CT.

Richmond FURNACES

BLODGETT'S PATENT PORTABLE OVEN

FOR

Hotels,
Steamships,
Confectioners,
Public Institutions, &c.,
Core Baking,
Bluing,
Hardening Rubber Goods,
Bronzing,
Hardware Specialties, &c.

The only Oven Baking by Perfect Circulation of Hot Air.

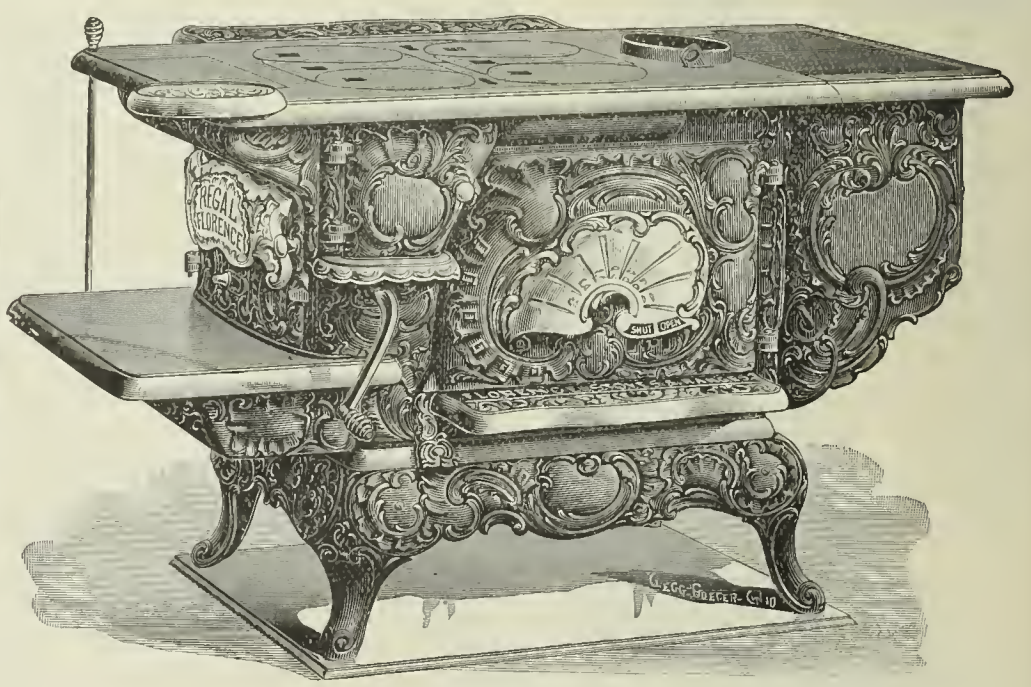
Made in ten sizes. Send for Catalogue.

— ALSO —

Bicycle Enameling Ovens.

THE G. S. BLODGETT CO., Mfrs.

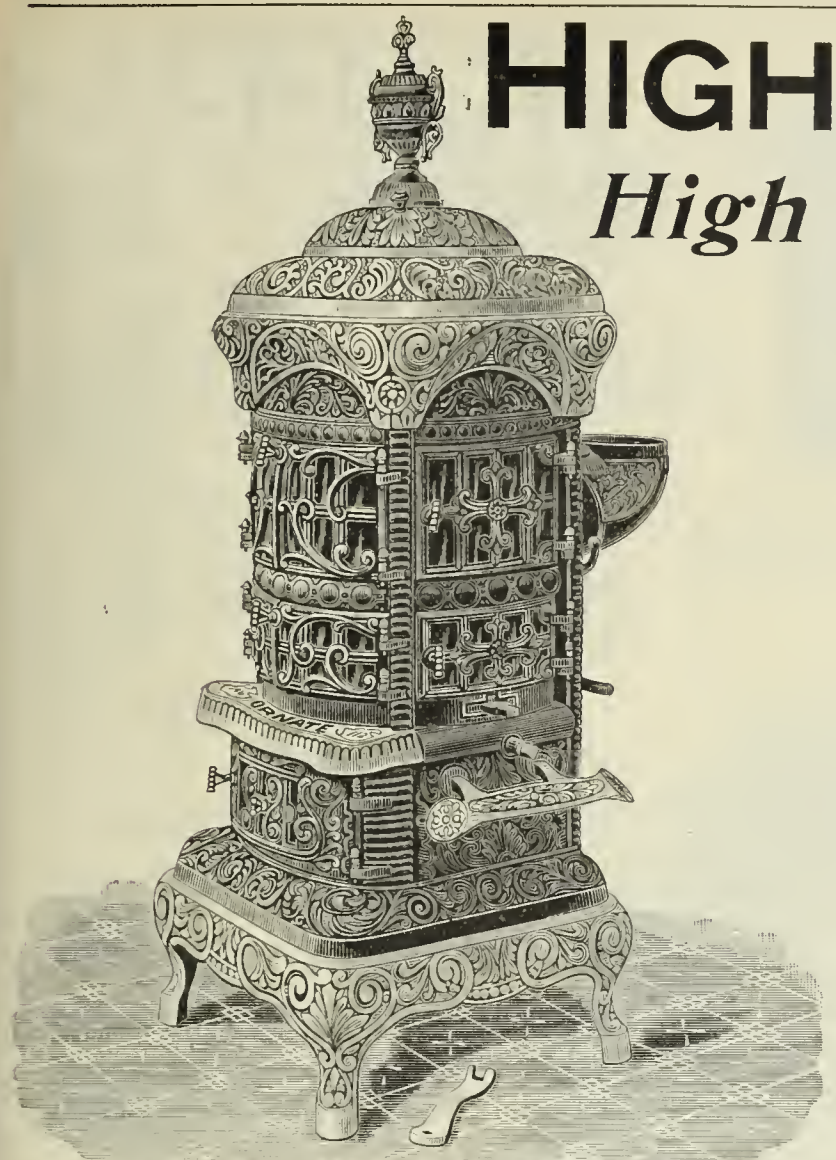
BURLINGTON, VERMONT.



REGAL FLORENCE

Unexcelled in style, finish and working qualities. Strictly high grade at moderate price. Write for new Cata. and Discounts.

C. EMRICH,
COLUMBUS, OHIO.



HIGH, YET LOW.

High in Grade, Low in Price.

IF YOU want a "seller" you need not look beyond this stove---you need only show it and name the price to get the order. If you are in business for "profit" send us a postal for a description and the price of this stove; it will be a cent well invested, as you will find.

SCHUYLKILL VALLEY STOVE CO., - SPRING CITY, PA.

The question of Economy is the greatest importance in connection with the use of Gas.—Patented.

ACME NATURAL GAS STOVES.

No. 636. SEND FOR CATALOGUE, NOW READY.

Ask your jobbers for them, or write to us.

The Best Line of Gas Stoves made—20 Styles and Sizes.

Acme Gas Stoves,

For Natural Gas.

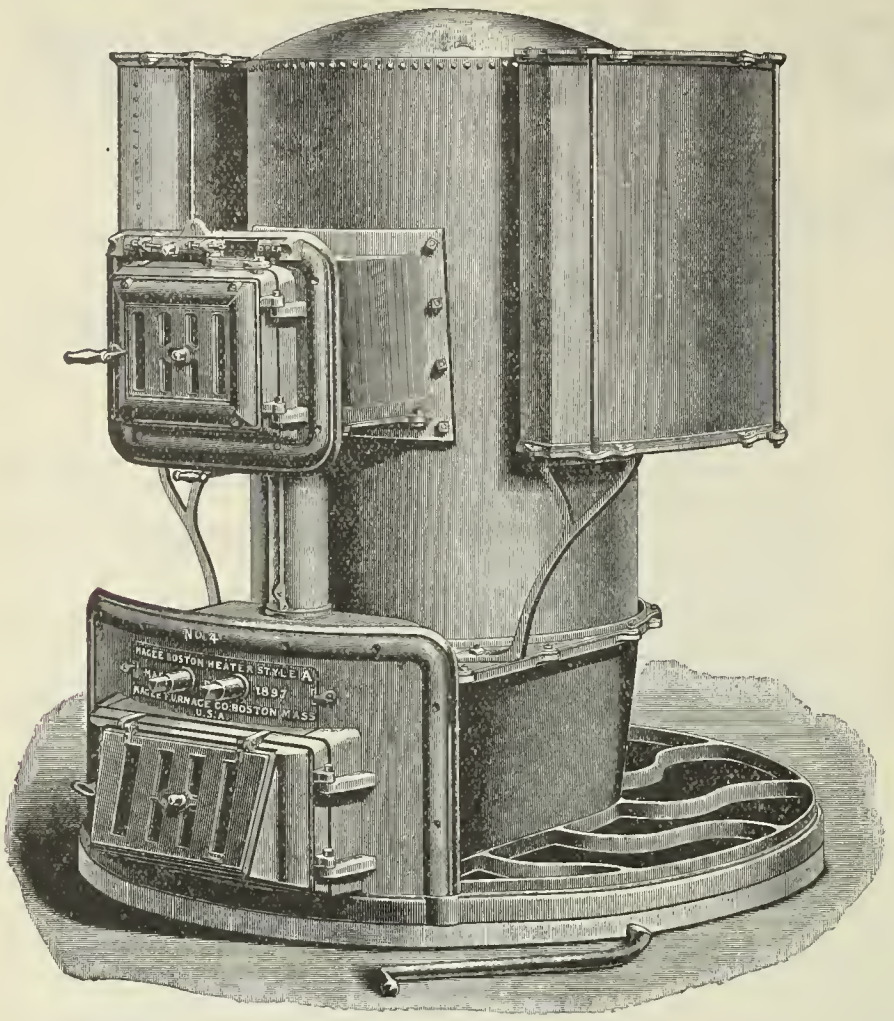
Lustre Gas Stoves,

For Artificial or Nat. Gas.

Manufactured by

H. ADLER, Tr.,

14 & 16 Wood St., PITTSBURG, PA.



MAGEE

Boston Heater "A" Series.

FOR HARD COAL.

Made in 6 Sizes. 3 Sizes for Masonry.

Everything seems to be coming Boston's way this year: The Base-Ball Championship, the Constitution, Rapid Transit,

AND NOW THE

MAGEE BOSTON HEATER "A."

See that Radiator,
Note the Heating Surface.

POINTS OF MERIT:

LIBERAL FLUE CAPACITY,
TWO STYLES OF POT,
REVERTIBLE FLUE RADIATOR,
JOINTLESS CONSTUCTION,
DOCK ASH GRATE,
GAS AND DUST TIGHT,
SOLID BRASS HINGE PINS.

For Warm Air alone, or in Combination Warm Air and Hot Water.

THESE ARE SOME OF THE REASONS.

Ask us to mail you circulars illustrating construction and distinguishing features, and see if we are right.

REMEMBER the name, "MAGEE," and that we have a full and complete line of Ranges, Furnaces, Combination, Hot Water and Steam Heaters, fully warranted. CORRESPONDENCE SOLICITED.

MAGEE FURNACE CO., Makers Highest Grade Heating and Cooking Apparatus for all uses.

32-38 Union St., BOSTON.
86 Lake St., CHICAGO.
27 New Montgomery, SAN FRANCISCO.

FURNACES?

CONTINENTAL STOVES — BUCKWALTER STOVE — ROYERSFORD, PA.

Please the People.

We make the most complete line.

ECLIPSE DUPLEX

IS THE STRONGEST HEATER KNOWN.

ECLIPSE

IS POSITIVELY A SELF CLEANER.

ECLIPSE JUNIOR

IS THE MOST PRACTICAL HEATER.

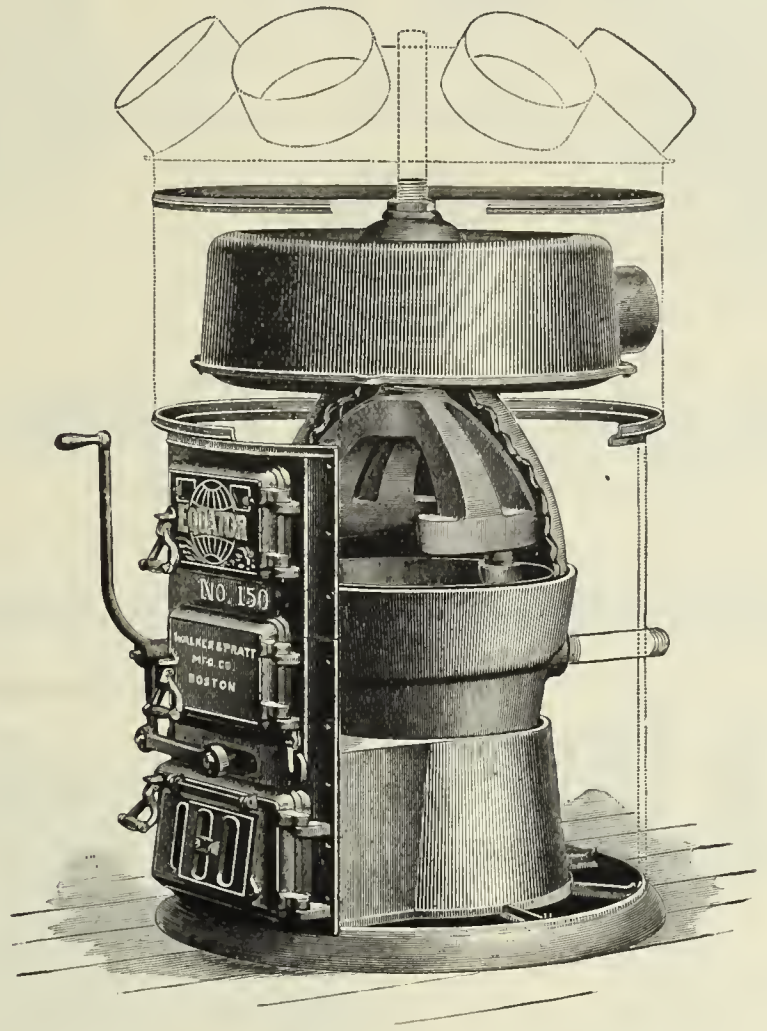
STORM *IS A RATTLING GOOD CHEAP HEATER.*

SEND FOR CATALOG.

BUCKWALTER STOVE CO., - Royersford, Pa.

EQUATOR
Hot Air Furnace,
PLAIN OR COMBINATION.

Six Good Sizes.



Pots 18 to 32 inch.

The best-selling furnace in New England. Simple, durable, convenient, easy to sell, easy to set up, easy to manage.

Best grate and shaker, large doors, large ashpit, brass hinge-pins, enameled water-pan. Shovel, poker and Walker cone check-damper with every Furnace.

Walker & Pratt Mfg. Co.,

"Crawford" Ranges, The "Culinet,"
Furnaces and Water Heaters.

BOSTON.

Hart & Crouse Co.

ROYAL HEATERS.

All Kinds of Heating Apparatus.

UTICA, N. Y.

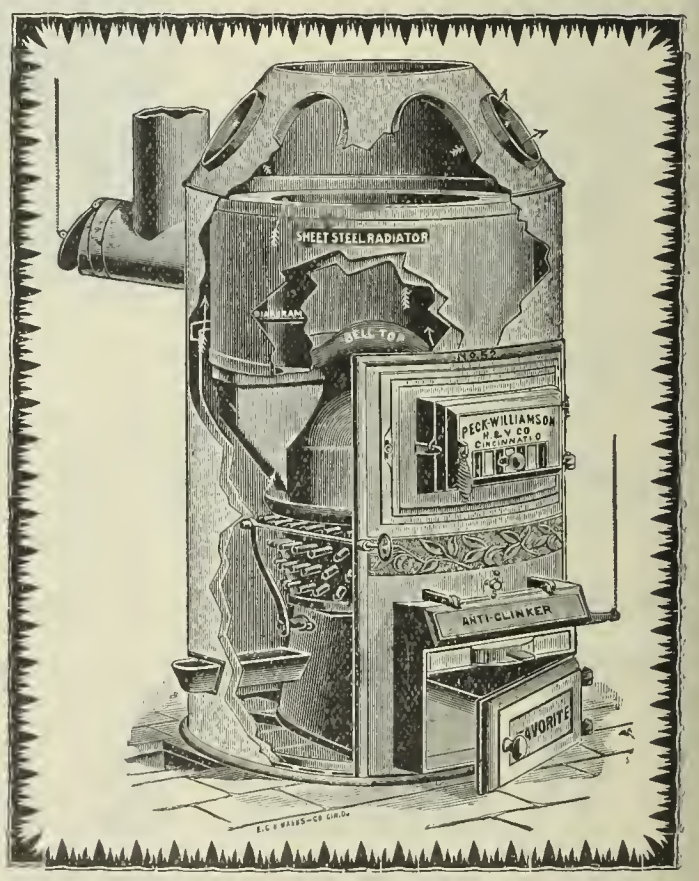
235 Water St., New York.
79 Lake St., Chicago.
Columbus, O.
St. Louis, Mo.

Royal Heaters Lead All Others.

Sold on their Merits, not on their Antiquity.

Without a Defect

The Favorite Furnaces are so recognized and endorsed everywhere because *they are*. Our agents have never had to take one out or substitute another make. They are constructed on honor, and to use them is to attain that satisfaction in a heating apparatus so essential but difficult to obtain. Can't you place one or more in your vicinity? We ship same day order is received. There's money in it for you, Dealer.



The Peck-Williamson Heating & Ventilating Co.

HOME OFFICE AND FACTORY,

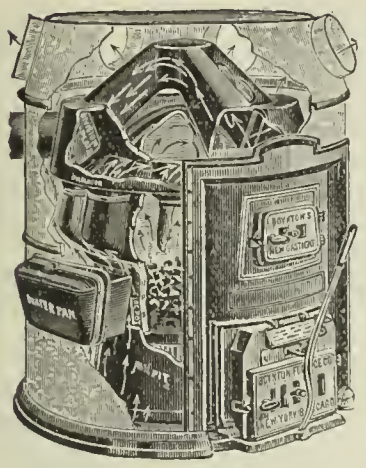
335-337-339 West Fifth Street,
320-322-324 Perry Street,
CINCINNATI, O.
526 to 532 Freeman Avenue.

BRANCH OFFICES:

New York, N. Y. | St. Louis, Mo. | Pittsburg, Pa. | Cedar Rapids, Ia. | Memphis, Tenn.
Atlanta, Ga. | Columbus, O. | Houston, Tex. | San Francisco, Cal.

BOYNTON

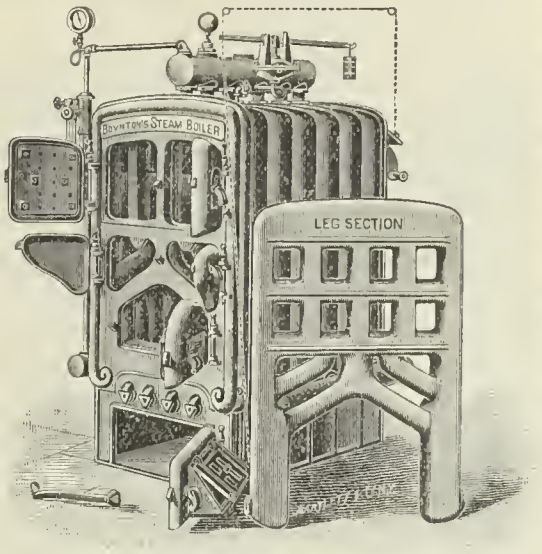
**HOT WATER HEATERS,
STEAM BOILERS,
FURNACES,
RANGES, ETC.**



BOYNTON'S NEW GAS TIGHT FURNACE.

Remember it is the name BOYNTON we wish you to recall when in want of steam heaters, hot water heaters, furnaces, ranges, etc. Our goods are for sale by best dealers all over the country.

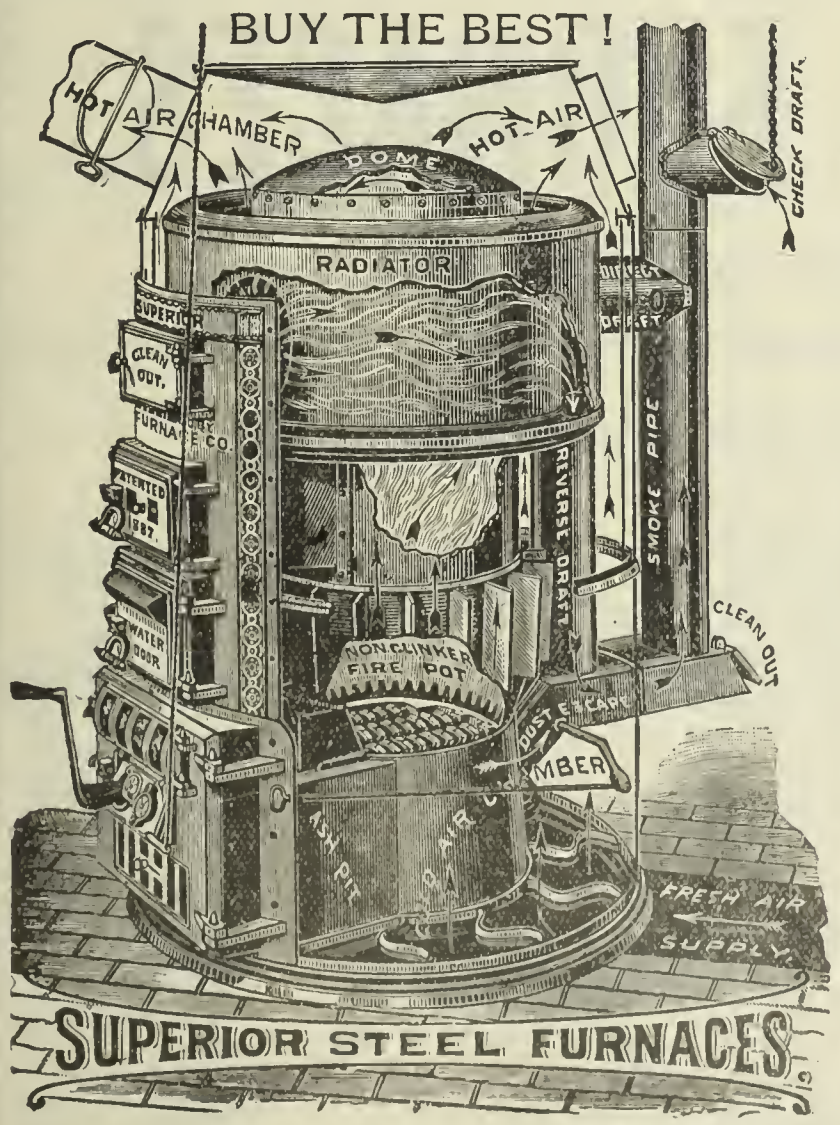
Send for Catalogue and Prices.



BOYNTON'S STEAM BOILER.

The Boynton Furnace Co.,

207 and 209 Water St., New York. 44 and 46 Dearborn St., Chicago.



SUPERIOR
FURNACES AND HEATERS
ARE DURABLE.

Office of
E. D. F. Brady,
Attorney at-Law.

Washington, D. C., June 8, 1897.

Superior Foundry Co.,
Little Falls, N. Y.

Dear Sirs:—I take pleasure in stating that the "Superior" Hot Air Furnace which I had put up in my residence in Garrett Park, in 1891, has given in every respect. the fullest satisfaction.

For heating capacity, durability, and economy of consumption of fuel, I think from my experience I can state your furnace has no superior. It has been in constant use every winter from October, 1891, has done its work most satisfactorily, and no part of it has broken or been burnt out. Since you placed it in position I have not been under one cent's cost for breakage or repairs of any nature.

I will add that many friends of mine, who, upon my recommendation, have had your furnaces put in their dwellings, have spoken of them in the highest terms. Yours truly,

E. D. F. Brady.

Thoroughly Modern in every Feature.

SEND FOR CATALOGUE.

CORRESPONDENCE SOLICITED.

SUPERIOR FOUNDRY CO.,

SOLE MANUFACTURERS LITTLE FALLS, N. Y.

"PERFECT"

(TRADE-MARK.)

Warm Air Furnaces

ARE UNIVERSALLY POPULAR ALL OVER THE U. S.

They are Economical in Fuel.
They Heat Well.
They Please the Buyer.
They Please the Trade.

They CONTAIN the NEWEST INVENTIONS of the latest DEVICES and IMPROVEMENTS.

Trade wanting the Best Furnaces will do well to correspond with

RICHARDSON & BOYNTON CO.

ESTABLISHED 1837,

232 and 234 Water Street, New York.
94 Union Street, Boston.
84 Lake Street, Chicago.

KERNAN FURNACES.

Made in All Sizes and Styles.

Hard Coal. Soft Coal.

All Cast Iron or Steel Plate Radiators.

Heavy Smooth Castings.

Efficient, Durable and Economical Heaters.

Hot Water Attachments.

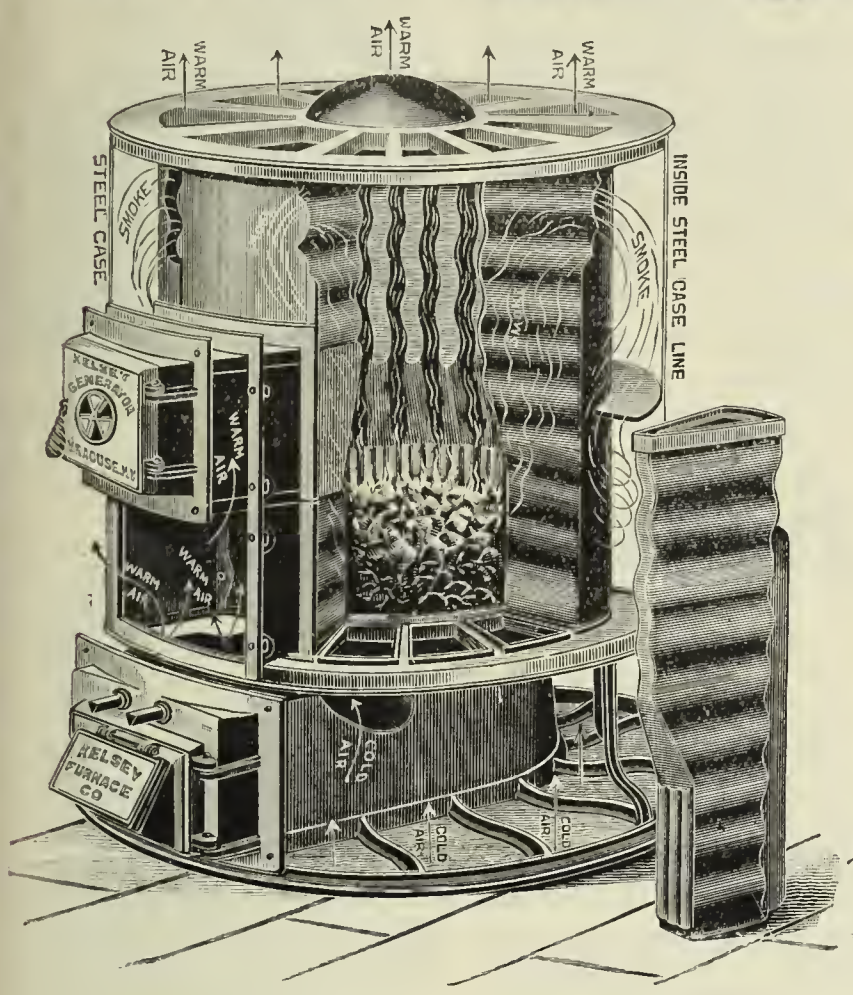
ASK FOR DISCOUNT. . . . .

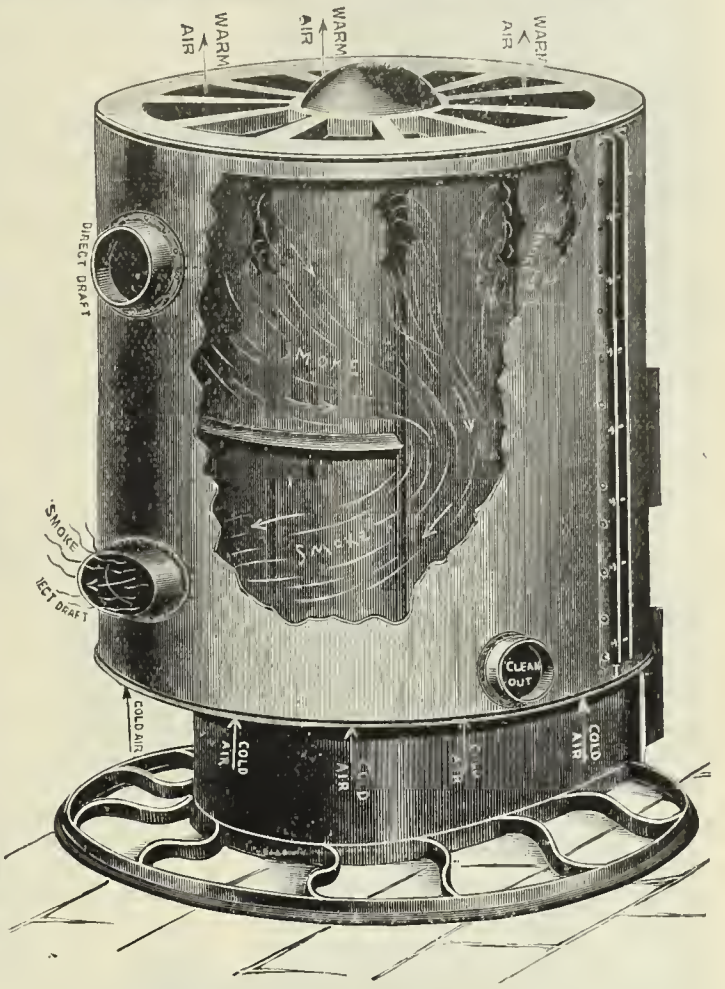
KERNAN FURNACE CO.,

CHICAGO. NEW YORK CITY, 105 Beekman Street. UTICA, N. Y.

KELSEY

WARM AIR GENERATORS





Have greatest possible heating surface in direct contact with fuel in combustion.

Have long down indirect draft, always assuring cool smoke pipe and thus economizing fuel.

Are Heaters that have established for many dealers a satisfactory and lucrative heating business.

ARE AN ASSURED SUCCESS WHEN PROPERLY PLACED.

FOR CATALOGUE AND PRICES WRITE

Kelsey Furnace Company, Syracuse, N. Y.

239 Water Street, N. Y. City. **173 Lake Street, Chicago, Ill**

JAMES SMART MANFG. CO., Brockville, Ontario, Manufacturers for Canada.

THE Calorific AND Calorific, Jr.,

Steam and Hot Water Heaters,

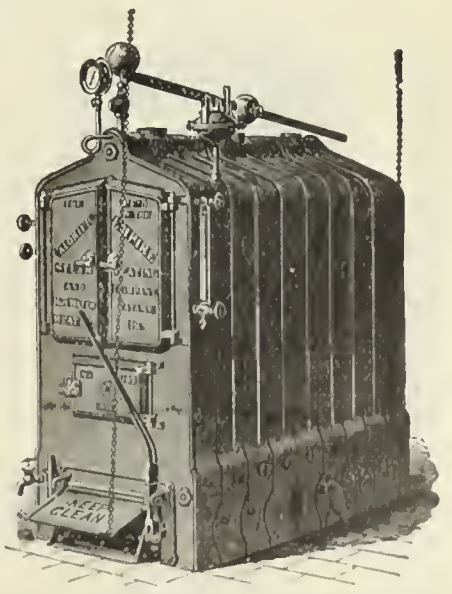
Manufactured by the

EMPIRE HEATING CO., TATAMY, PA.

For low pressure steam and hot water heating they have no superior. More good points than any other heater on the market. Excellent heating surface, the best grate arrangement out. It is economical, durable and convenient. Made in a large variety of sizes, suitable for all purposes. From the smallest to the largest job. Write for illustrated catalogue and prices and discount to . . . .

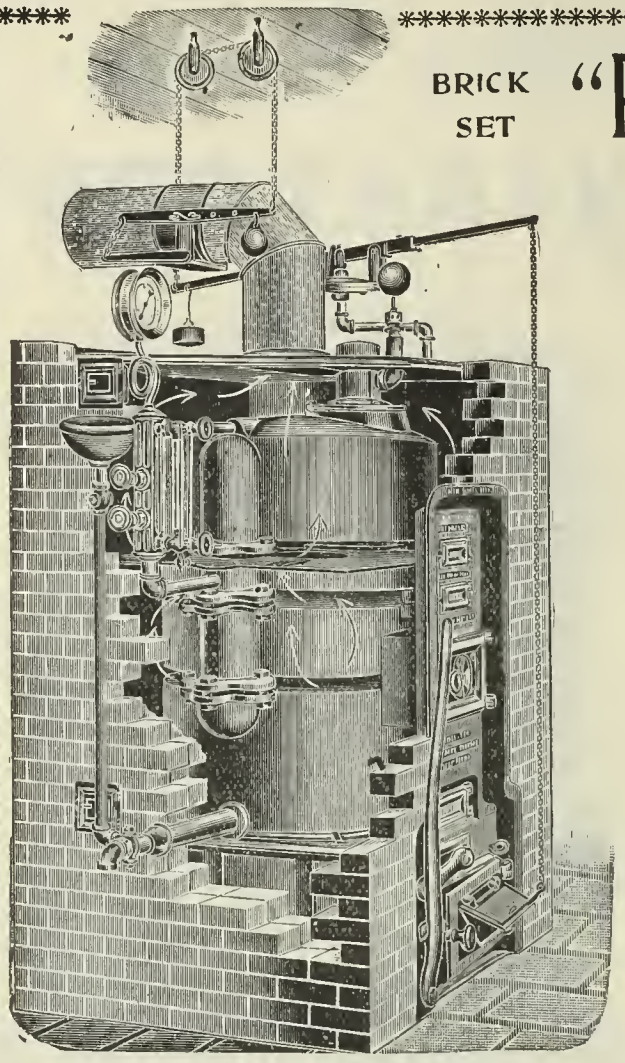
JAMES WALP, Gen'l Manager,

675 Northampton St., *EASTON, PA.*



CASSADY & SHAY,

New York Sales Agents, 509 W. 26th STREET.



BRICK SET "Plummer" STEAM HEATER "New Model."

Cut shows Boiler and how it is put together, from Ash Box to Steam Dome. Arrows show in which direction fire must travel to reach chimney.

A large amount of available heating surface, which can be easily reached and kept clean, makes it a very *powerful heater*.

Every boiler tested 60 lbs. cold water pressure and warranted free from imperfections. The Plummer has stood the test as an economical and practical *house warmer* for 12 years.

MADE IN OUR OWN FOUNDRY AND MACHINE SHOP.

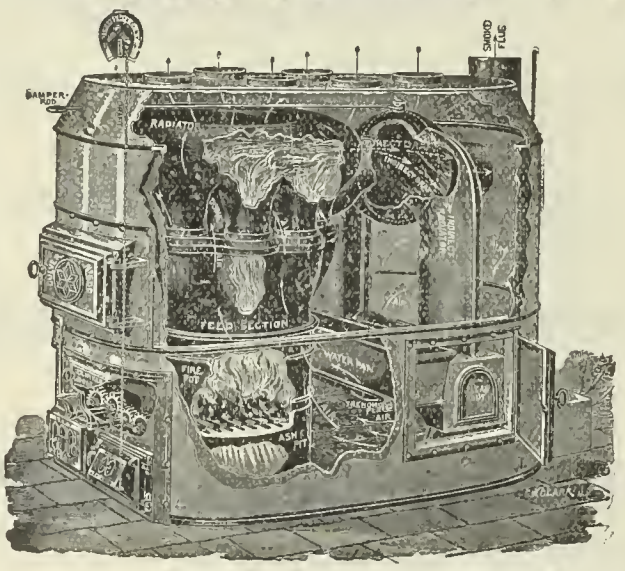
Send for Prices and Territory.

The Putnam Foundry & Machine Co.,

PUTNAM, CONN.

MANUFACTURERS,

Plummer Steam Heater, Leader Hot Water Heater,
Plummer Sectional Boiler, Nutmeg State Furnace.



THE SIMONDS FURNACE CO.,

SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,

No. 50 CLIFF ST., NEW YORK,

Manufacturers of the Celebrated

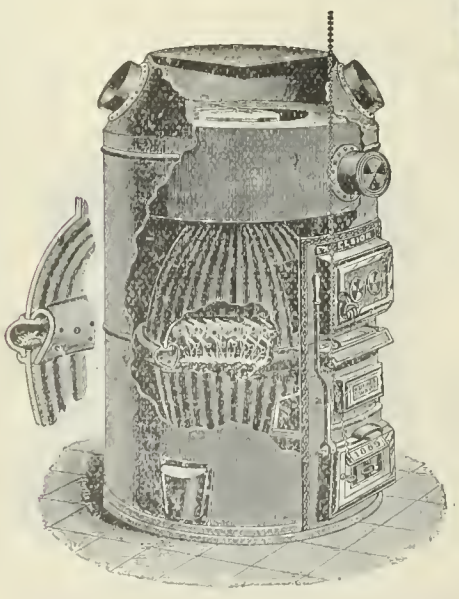
"CULVER AND MONTANA FURNACES."

Double and Single Oven Ranges, with special features and latest designs.

STEAM AND HOT WATER BOILERS

Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

Send for Catalogues and Prices.



FURNACES AND FITTINGS.

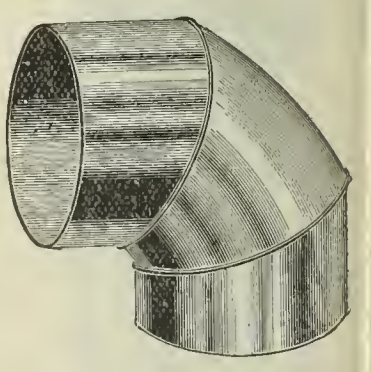
ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

THE EXCELSIOR STEEL FURNACE CO.,

38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line

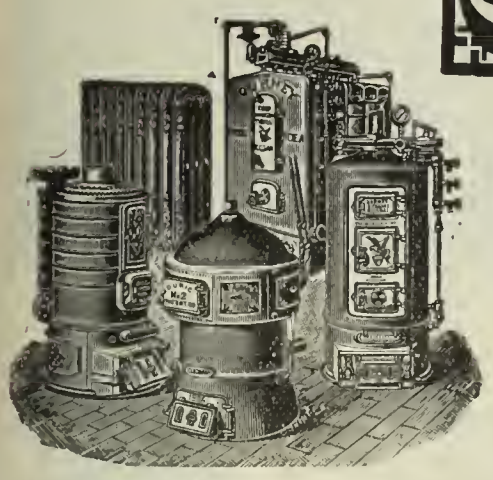


of Furnace Pipes and Fittings.

1897

Gurney

1897

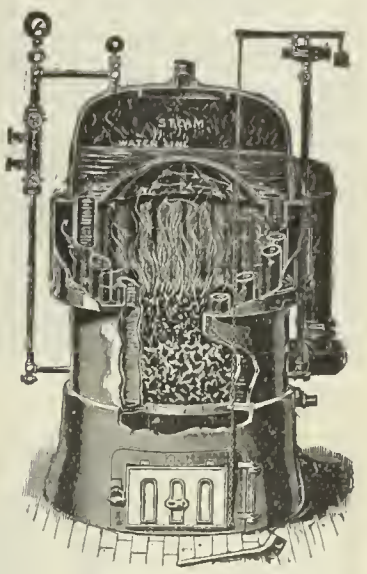


Hot Water Heaters,
Steam Boilers and Radiators.
THE STANDARD OF THE WORLD.
SEND FOR LATEST TRADE CATALOGUE.

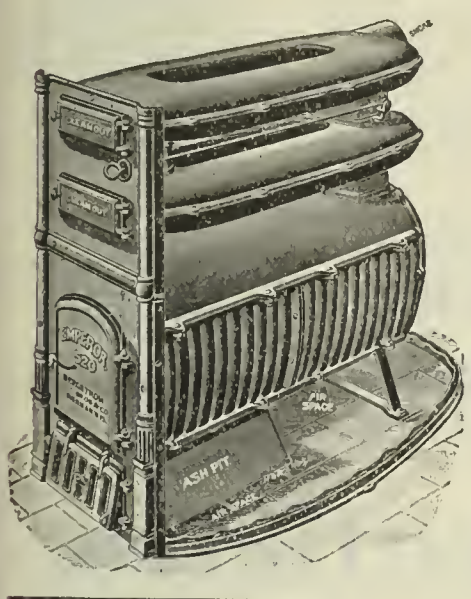
SOLD ONLY THROUGH THE TRADE.

GURNEY HEATER MFG. CO.,
163 Franklin St., Cor. Congress,
BOSTON, MASS.
New York City Branch, 48 Centre Street.

CAPACITIES TO MEET ANY
...REQUIREMENT...

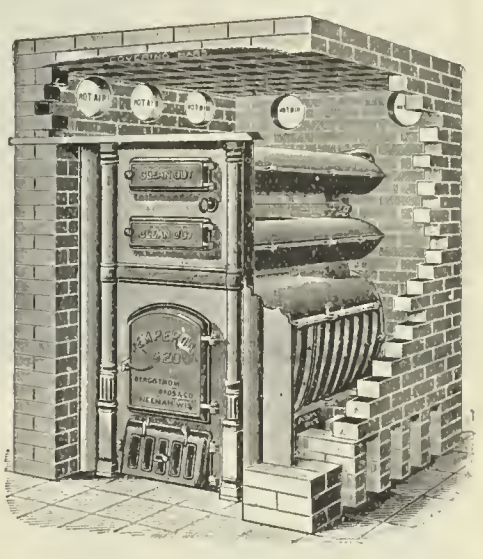


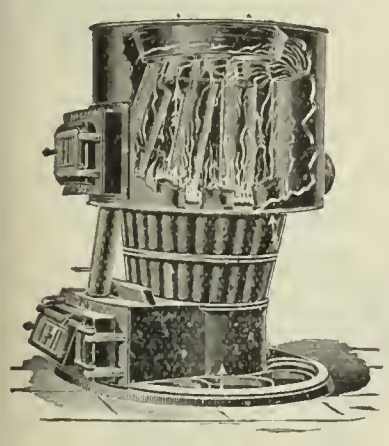
SECTIONAL VIEW.
DORIC SEAMLESS TUBULAR
STEAM BOILER.



EMPEROR FURNACES
FOR WOOD.

Simple, Safe. Durable.
ECONOMICAL IN FUEL.
The Best and Cheapest Line of Wood Furnaces.
Furnished for either Brick or Galvanized iron Casing.
SEND FOR CATALOGUE.
Bergstrom Bros Co.
NEENAH, WIS.





The Fox Furnace.

Don't experiment with your furnace.
Get the best in the market.
Write us for particulars, catalogue and prices.

THE FOX FURNACE CO.,
Seneca, Noble and Bright Sts., - - - Cleveland, Ohio.
36 La Salle Street, CHICAGO, ILL. The Moncrief-Dowman Co., ATLANTA, GA

THE THERMOSTATIC PLATE.

TO DAMPER OVER PULLEYS.

Coal Is Up.

WHY NOT
KEEP EXPENSE DOWN
BY USING THE
HOWARD AUTOMATIC DRAFT REGULATOR?
IT IS MADE AND GUARANTEED BY
HOWARD THERMOSTAT CO.,
OSWEGO, N. Y.
N. Y. City Office, 210 Water Street.

The THERMOSTAT
is placed on the wall of a living room and operates solely by power obtained from contraction and expansion of metals. By means of a connection over pulleys IT automatically operates the DRAFT DAMPERS connected to heater and gives you an
"EVEN-TEMPERATURE,"
WITH
HEALTH,
COMFORT and
ECONOMY
ON THE SIDE.

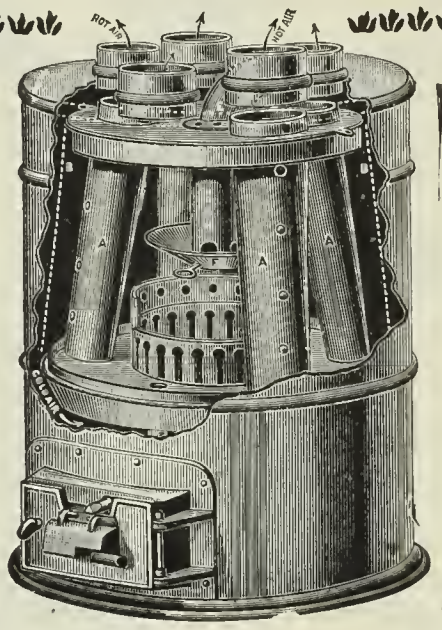
WARM-AIR FAULTLESS FURNACES

GRAFF & COMPANY
MANUFACTURERS
208 WATER ST.
NEW YORK

HERO
HOT BLAST,
OREGON,
RIVAL AND DREXEL
GREATEST VARIETY.
MOST GOOD POINTS
FOR ALL KINDS OF FUEL.

STANDARDS OF EXCELLENCE.
BEST OF WORKMANSHIP.
MOST ECONOMICAL IN FUEL.
BEST IN HEATING QUALITIES.
FAULTLESS RANGES.
THE VERY BEST.
GET OUR CIRCULARS & PRICES

Do You Want to Increase Your Furnace Sales ?



THE H. H. RICE

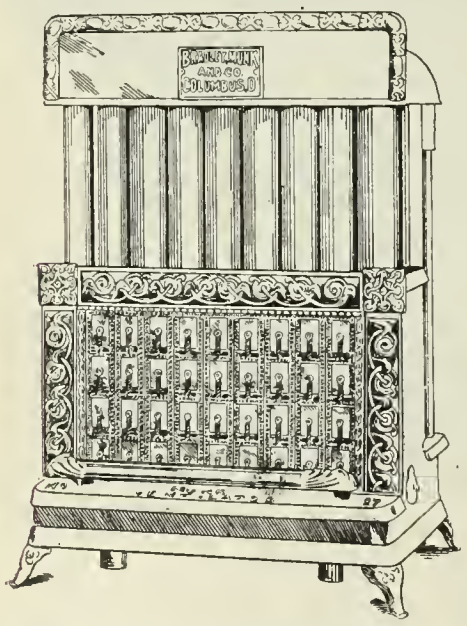
POSITIVE FURNACE

WILL DO IT.

The public are not asleep, and when any decided improvement is placed at their disposal they soon show their approval, as our past sales of the Positive show, and our encouraging orders for 1897 from firms who set the Positive in 1896, being the first year it was put on the market.

SEND FOR CIRCULAR AND PRICES.
THEY WILL INTEREST YOU.

THE TURNER HEATER CO.,
BRISTOL, CONN.



Munk Ventilator

Expressly designed for Heating and Ventilating Houses, Churches, Halls, Business Rooms, etc., with natural gas as fuel. Absolutely prevents Drafts of Cold Air from doors and windows. Insures against cold feet and ill-health from uneven distribution of heat, as all foul air is removed from rooms by its use. Guaranteed. Write for descriptive circulars.

BRADLEY, MUNK & CO., 197 So. High St., Columbus, Ohio.

STOVE REPAIRS.

A complete line for all makes of

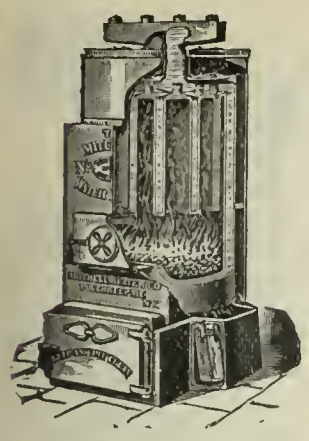
FURNACES, RANGES and STOVES.

Bricks, Water Backs, Mica, Nickel Door Knobs, Bolts, Rods, Blacking, Asbestos Cement, Registers, Stove Pipe, Elbows, Stove Urns, Wash Boilers, Etc.

SALES AGENCY FOR
Buckwalter Stove Co.,
Quick Meal Steel Ranges,
Jewel Oil Heaters.

E. F. KURTZ,
43 North Second Street, Philadelphia.

A Trial Order Will Make You a Customer.



The Mitchell Water Heater.

Has no Joints to Burn Out or Leak.

Heating Surface all in One Casting.

Water Passages all Vertical.

Largest Amount of Fire Surface

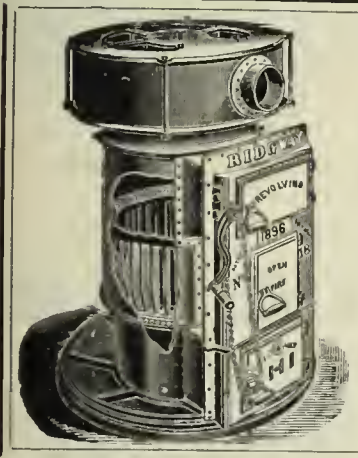
OUR 100 SERIES FOR STEAM OR HOT WATER.

Is constructed on the same general principle, but arranged to be used without jacket.

If you have competition and want to make a low estimate to secure the job, we can help you do it.

Write for . . . . Catalogue and Prices.

THE MITCHELL HEATER CO., 50-60 Pine St., POUGHKEEPSIE, N. Y.

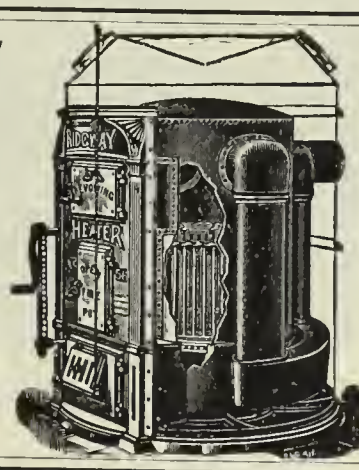


RIDGWAY

OPEN FIRE POT FURNACES.

Send for Catalogue.

Ridgway Furnace Co., Boston.



WOOD FURNACES

OUR IMPROVED MONITOR.

With DIRECT and INDIRECT DRAFT, is made in two sizes for Brick or Galvanized Cases.

No. 38 burns 3 ft. wood, No. 50 burns 4 ft. wood.

The fire-box is made of cast iron, **corrugated** very **heavy** and **substantial.** The dome and radiator are made of **heavy plate** iron (gas tight).

This furnace can be set in low cellars and is easily put into old brick work. With smoke pipe removed, radiator can be cleaned thoroughly in five minutes, by means of clean-out door in front.

Simple to manage and most economical in fuel, with an immense heating power.

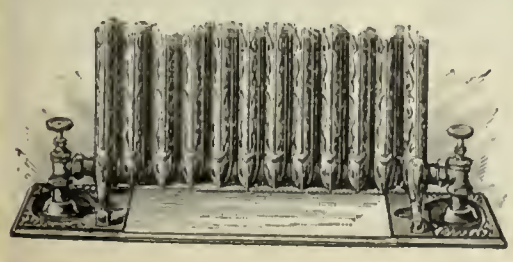
We also make the **CLIMAX and HOT BLAST WOOD FURNACES,** the best of their kinds at a lower price. Thousands in use in all sections of the country.

Testimonials and full particulars sent on application to the manufacturers.

THE MONITOR.

ESTABLISHED 1839. INCORPORATED 1894.

WOOD & BISHOP CO., Bangor, Me.



THE GORMAN RADIATOR REST!

A thoroughly practical device to finish under Radiators to assist steam fitter in making nice work.

Protects Floors, Carpets and Ceilings from Heat and Leakage.

Mfd. by GORMAN-ENGLISH CO., 59 Northampton St., Wilkes-Barre, Pa.

U. S. AND CANADA PATENTS.

THE METAL WORKER ESSAYS —ON— HOUSE HEATING —BY— Steam, Hot Water and Hot Air.

With Introduction and Tabular Comparisons.

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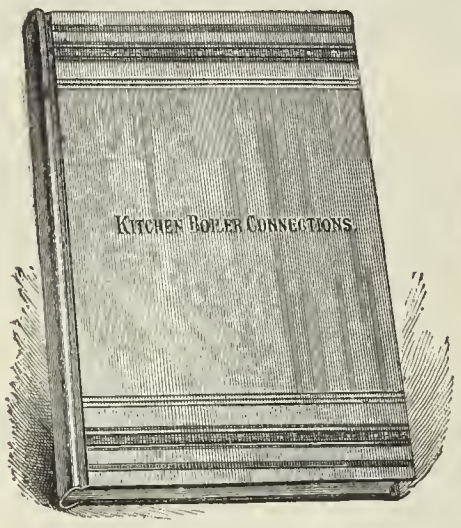

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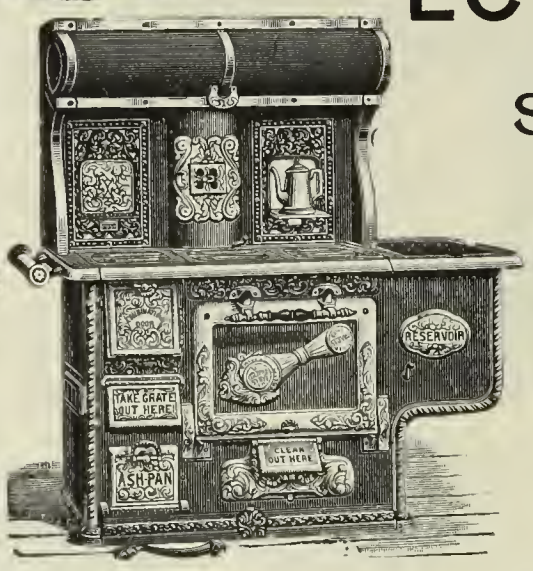

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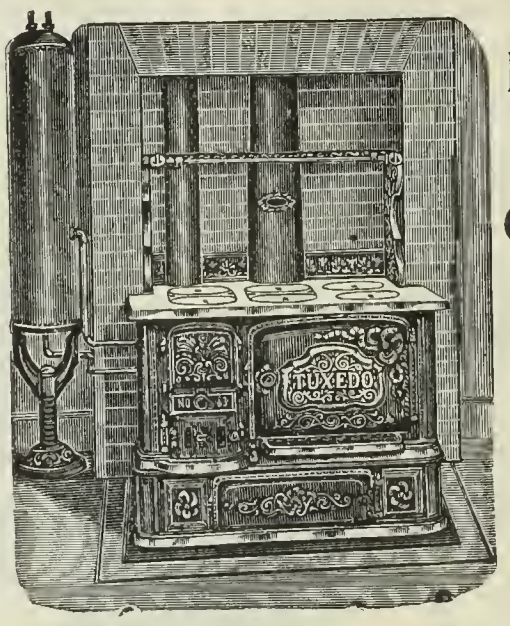

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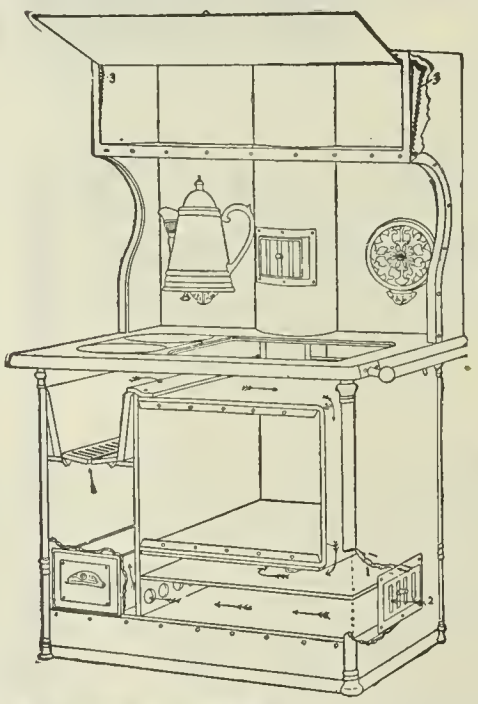

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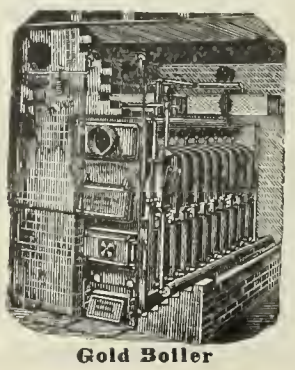

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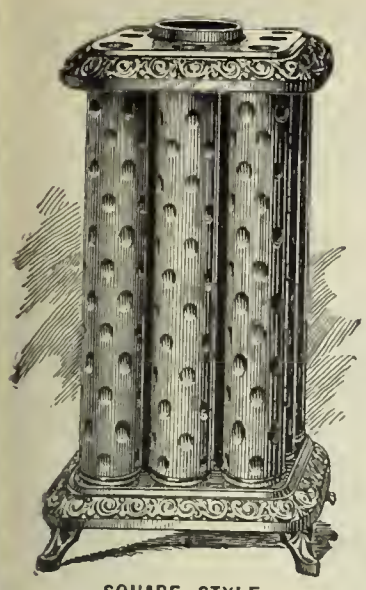

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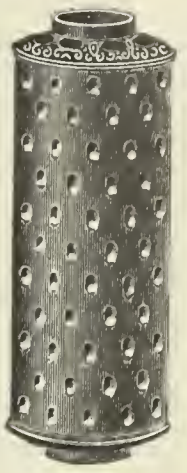

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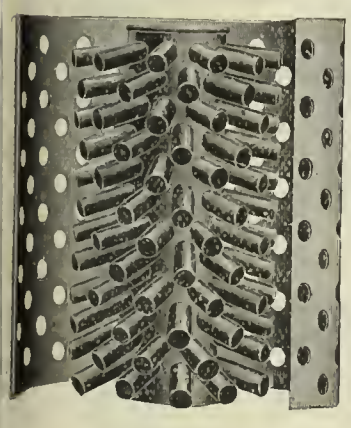

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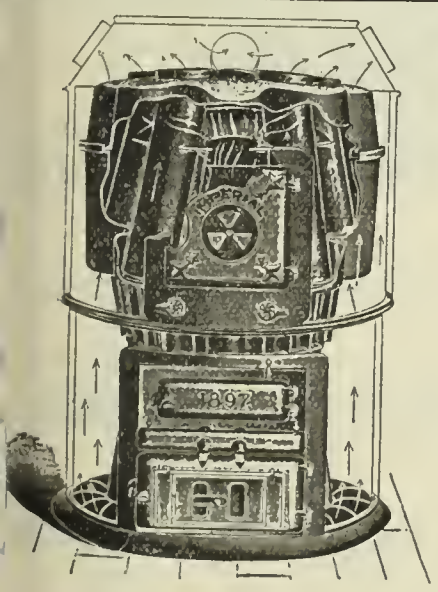

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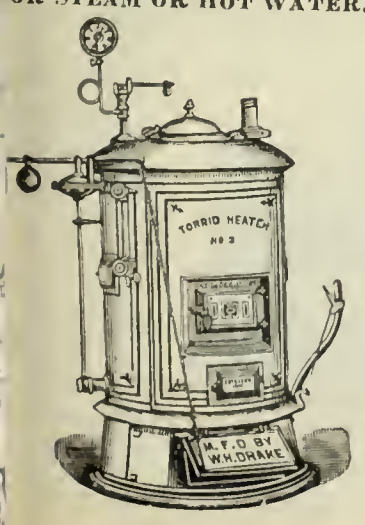

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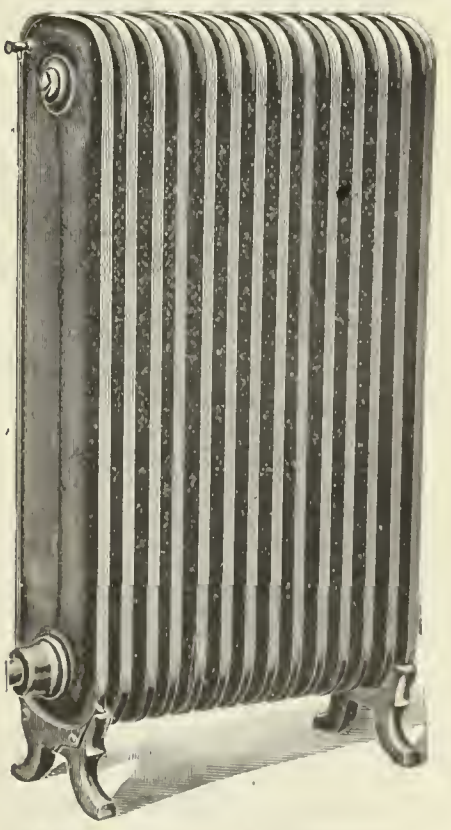

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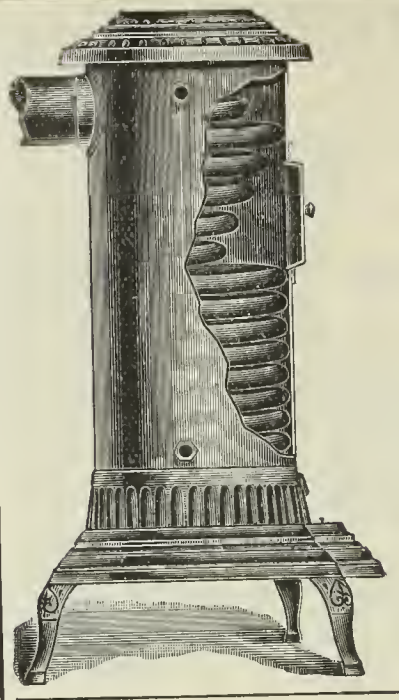

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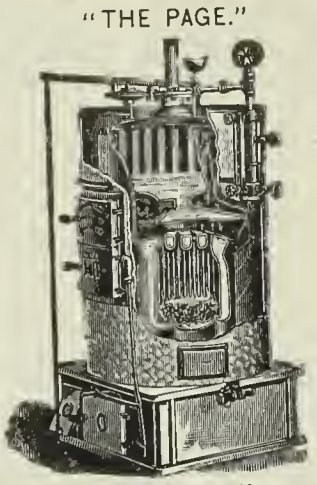

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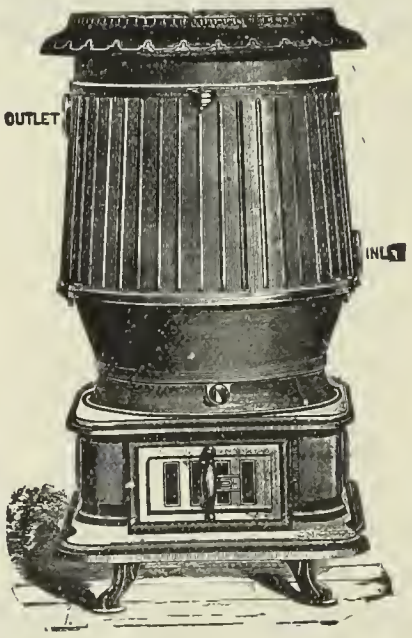

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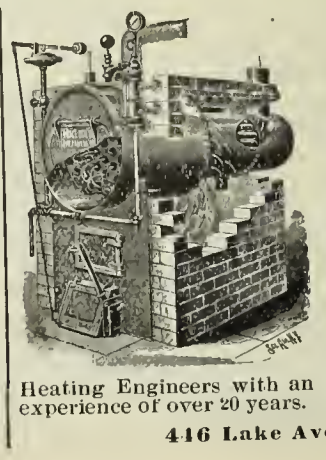

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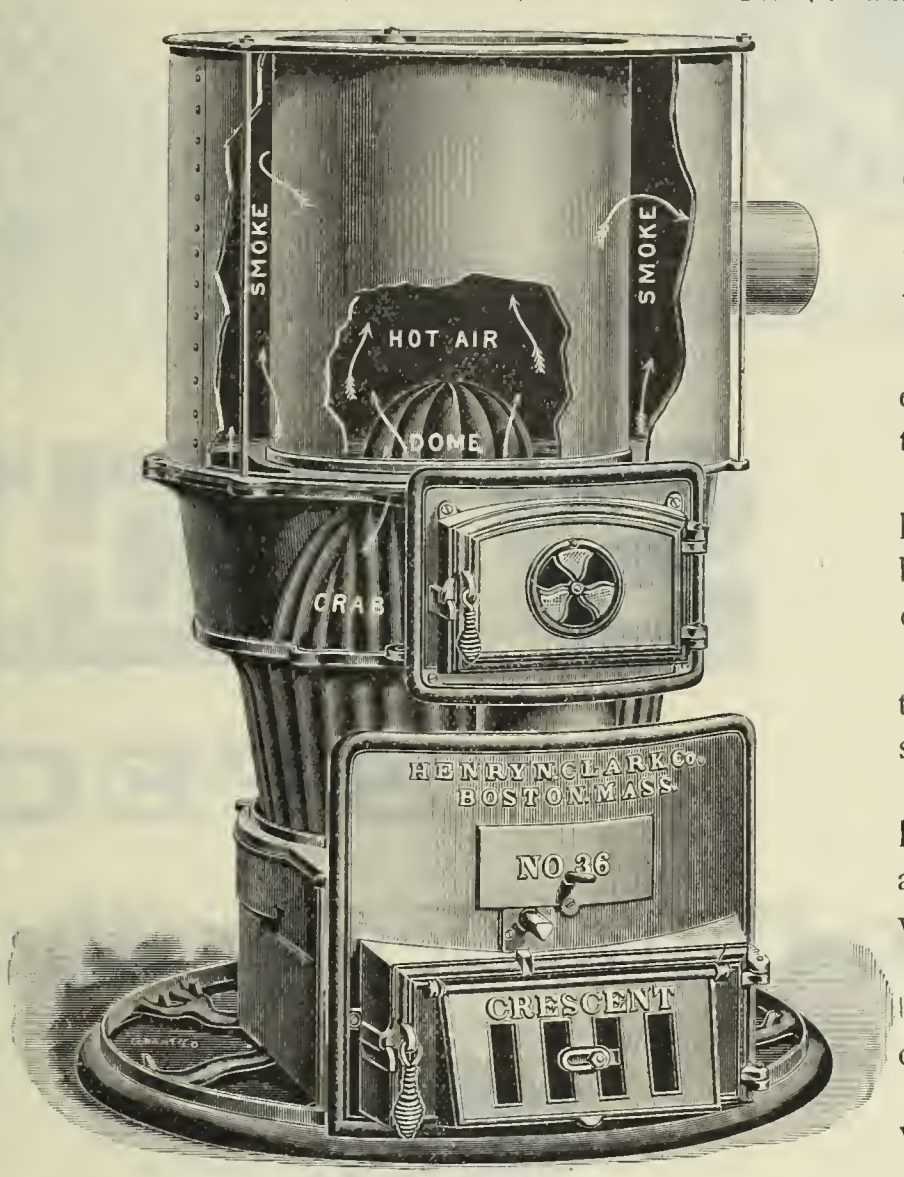

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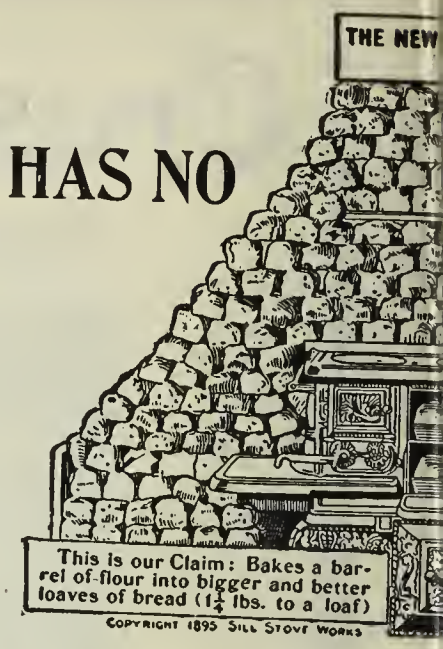
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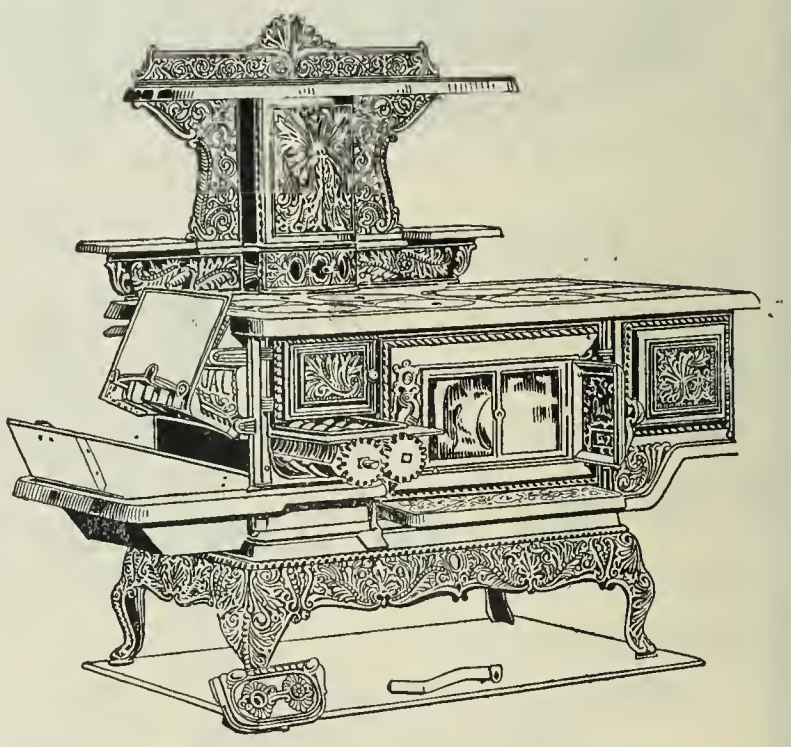

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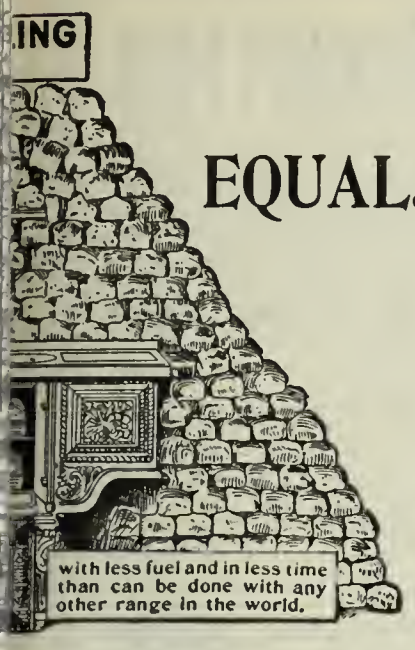

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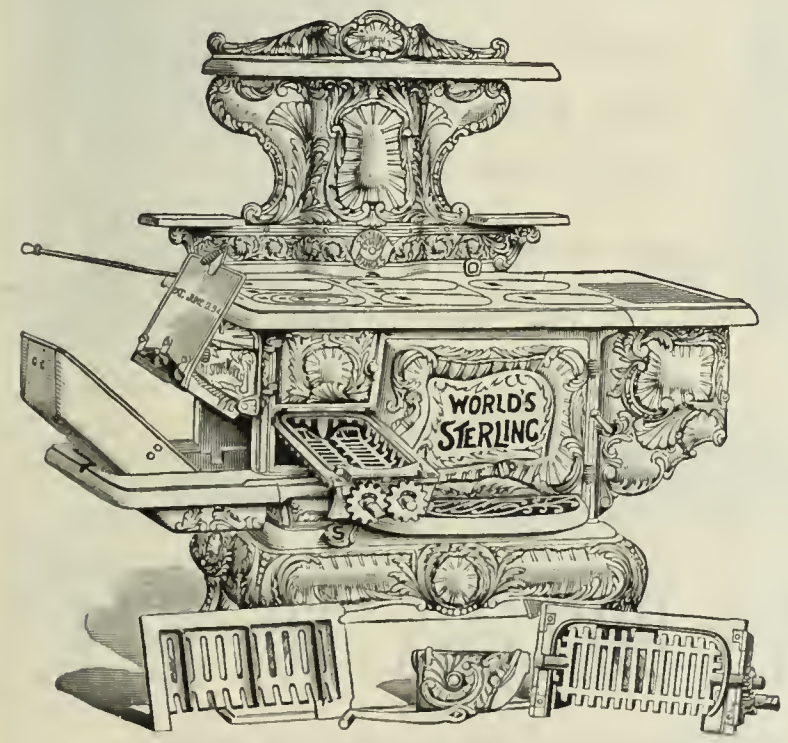

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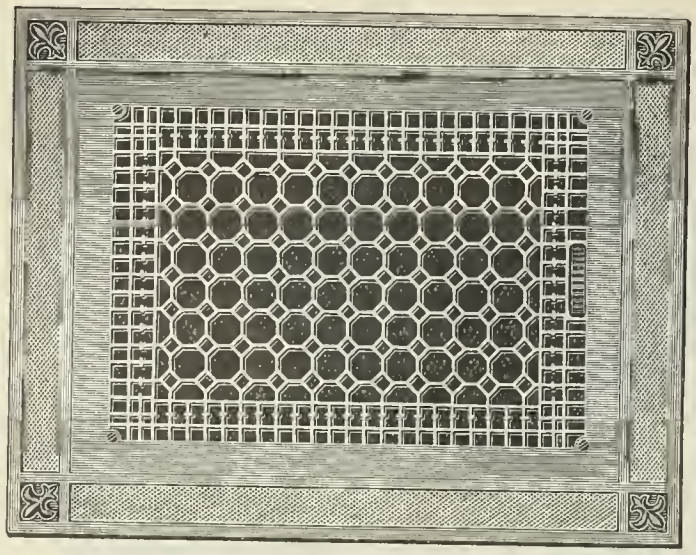

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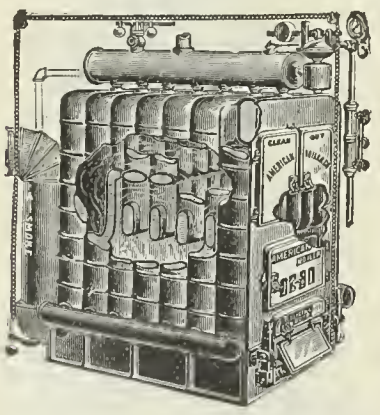

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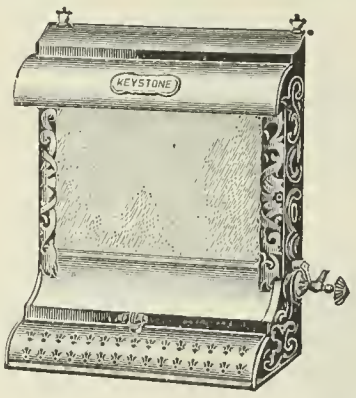

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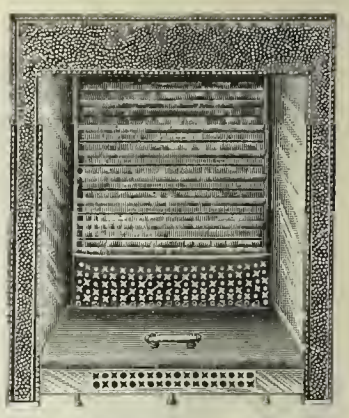

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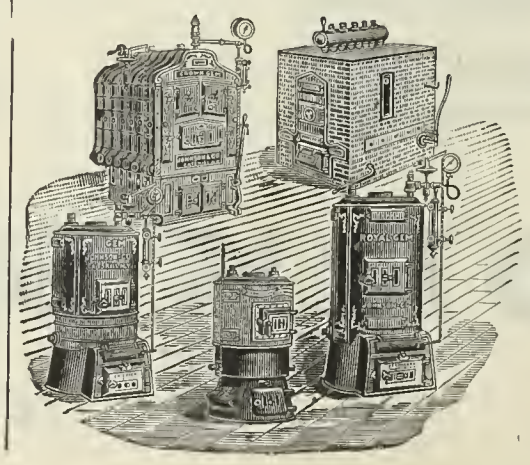

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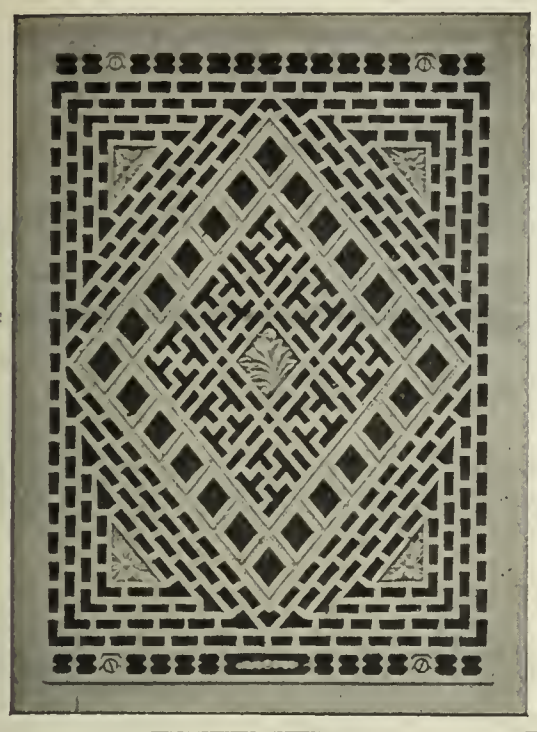

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THE ANSWER.

To the Largest Western Makers,

THE SCHREIBER & CONCHAR MFG. CO.,

DUBUQUE, IOWA,

Who carry in stock Black and White Japanned, Nickel, Brass, Bronze, Copper, and Antique Copper Finishes.

Send for Catalogue. *Write for Prices.*

If you write you saw "ad." in THE METAL WORKER, we will allow 1 per cent. extra discount on first order.

See the New

Somerset Pallas Range.

It is the finest Range on the market.

ALSO

The Somerset Grand Parlor.

Send for Catalogue.

Somerset Stove Foundry Co., Somerset, Mass'

Established, 1827.

W. JACKSONS SONS,

Manufacturers and Importers of

Grates, Open Fire Places, Fenders, Fire Irons, And-Irons, Tiles, &c.

Office and showroom, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

"MICA."

ASSORTED PACKAGES.

Put up Expressly for the Retail Trade.

ONE POUND—4 SIZES. ¼ lb. Each Size.		TWO POUND—8 SIZES. ¼ lb. Each Size.		
North Carolina, $2.25	5 x 6	North Carolina, $4.25	2½ x 3¼	2¾ x 4
Wyoming, · · 2.00	2¼ x 4	Wyoming, · · 3.70	2 x 4	2½ x 4
Montana, · · 1.90	2½ x 3	Montana, · · 3.55	2¾ x 2¾	2½ x 4½
	2¼ x 5		3½ x 5	5 x 7

THREE POUND—12 SIZES.

¼ lb. Each Size.

North Carolina, $6.00	4 x 5½	3 x 4	
Wyoming, · · 5.10	2¾ x 4¼	2½ x 3½	
Montana, · · 4.95	3 x 3	2 x 4½	
	2¼ x 4½	2¾ x 2¾	
	2½ x 3	2¾ x 3½	
	2 x 3½	5 x 7	

ABOVE PRICES NET. NO DISCOUNT.

☞ Mica delivered anywhere in the United States Free of Transportation Charges.

EUGENE MUNSELL & CO.,

NEW YORK, 218 Water St.

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$5 WILL BUY THREE POUNDS MICA

ASSORTED SIZES.

5 x 6	4 x 5	2¾ x 4
2½ x 3	2¾ x 5	2 x 4½
2¼ x 5	2½ x 4	3 x 3¼
2¾ x 2¾	2½ x 4½	2¾ x 4

Or, same assortment in Best North Carolina for $6.

DELIVERED FREE

PALERMO MICA CO.,

Miners and Wholesale Dealers,

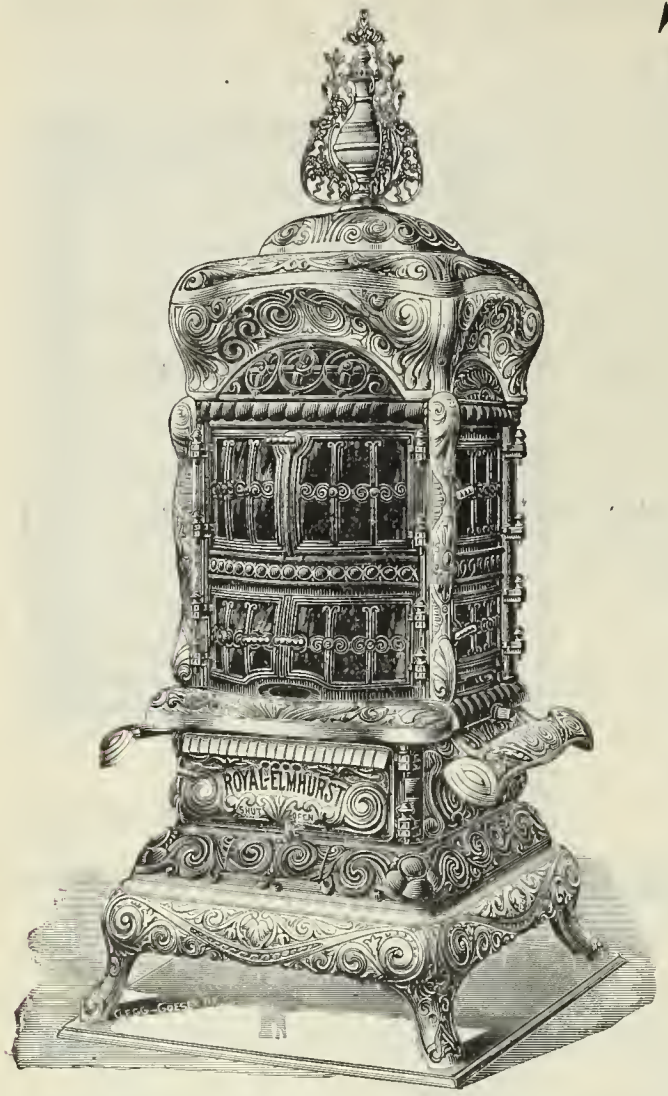
27 Peck Slip, NEW YORK.

—ENGLISHMAN—Can you tell me, my lad, how far it is to Kirkcaldy?

Scots Boy—Well, if ye gang on straight, it's aboot twenty-five thousand miles; but if ye turn back, ye're there in five minutes.—*Exchange.*

—NO CHANGE.—Mrs. Reader—Have they stopped growing sugar in Cuba?

Mr. Reader—Oh, no; they are still raising Cain.—*Detroit Free Press.*



No. 43.—13-inch Fire Pot.
No. 45.—15 " " "
No. 47.—17 " " "

The Royal Elmhurst

FIRST-CLASS BASE BURNER.

Beautiful Ornamentation,

Finest Nickeling (*Silvery White*).

Nickel Dome is Self-Mounting and Ventilated.

AUTOMATIC FEED LID.

HOT-AIR FLUES THROUGH ENTIRE LENGTH OF STOVE, "KITE" FLUE IN BASE.

Duplex Grate and Ball-Bearing Grate Rim.

EVERY STOVE IS A DOUBLE HEATER.

EVERYTHING YOU CAN THINK OF THAT IS GOOD AND NICE IN STOVE CONSTRUCTION IS FOUND IN THIS LINE.

Bergstrom Bros. & Co.,

NEENAH, WIS.

—"Some time ago," says a man who always trles to heed good advice, "I stopped eating hearty dinners on the advlce of an eminent physician, who said that a hearty dinner tended to shorten life. Not long afterward I saw that another physiclan, equally eminent, sald it was simply suicidal to eat a heavy luncheon, and so I made an apple or a cracker serve me for luncheon. It was pretty tough to get up from luncheon and dinner in a famished condition, but I consoled myself with the thought that I was lengthening my life. And, besides, I could eat a hearty breakfast. But the other day I saw that still another eminent physician says that no one who wants to live long should eat any breakfast, and I am puzzled to know what to do. These men are experts, and presumably know what they are talking about. But if I adopt their directions for the attainment of a long life it looks as if I might die of starvation in less than a month."—*New York Tribune.*

—He Took a Great Risk.—It is currently whispered that Mrs. ——, while cleaning house, asked her husband to nail up some [ ]. He refused. She looked †† at him, told him his conduct was without a ||, beat him with her ☞ untll he saw **. He now lies in a ,tose state and may soon be a fit subject for diss. A man must be an * his life in that way and put a . to his existence.—*Exchange.*

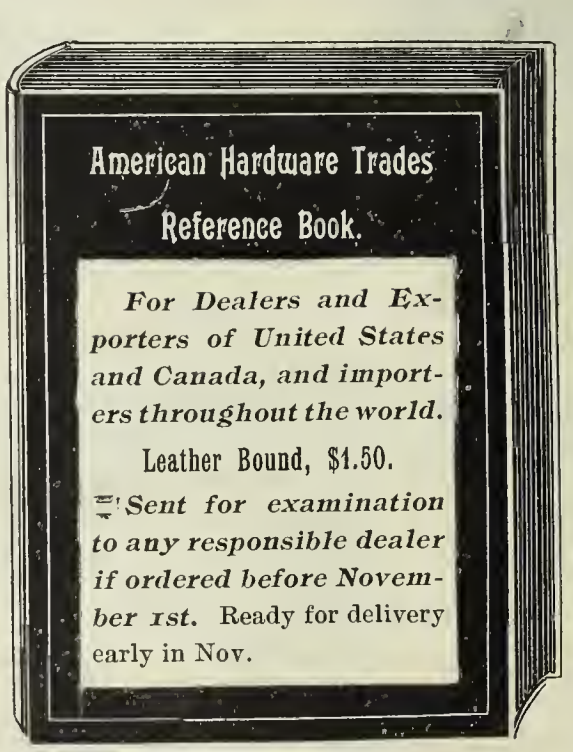
—Two Turks were at a French banquet. Toward the conclusion of the feast a Frenchman selected a toothpick from the tray near him and politely passed the tray on to his neighbor, who, however, peremptorily declined the offer, exclaiming: "No, thank you! I have already eaten two of the accursed things, and I want no more!"—*San Francisco Argonaut.*

VALUABLE TO HARDWARE STOVE . . . DEALERS.

It Gives

Name, address, branch offices and financial rating of every manufacturer in the Hardware, Stove, Implement, House-furnishing Goods, Plumbing, Tinware and all allied trades.

Indexed under 25,000 headings, enabling the user to instantly find all the manufacturers of any article, or who makes any special brand or kind of article.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The only *Complete* work for the use of Hardware, Stove, Bicycle, etc. Dealers, Plumbers, Steam and Gas Fitters.

It represents all manufacturers regardless of whether they advertise or not. Send headings for free insertion.

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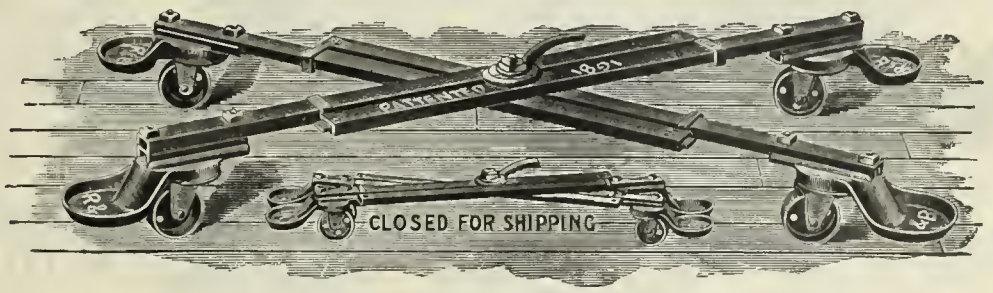
BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS CO., Publishers and Booksellers, 232-238 William Street, New York.

READ THIS OFFER!

We will send one or more of these Stove Trucks on trial for a month and take them back if not satisfactory.

THE ONLY TRUCK THAT DOES NOT SHOW UNDER A STOVE



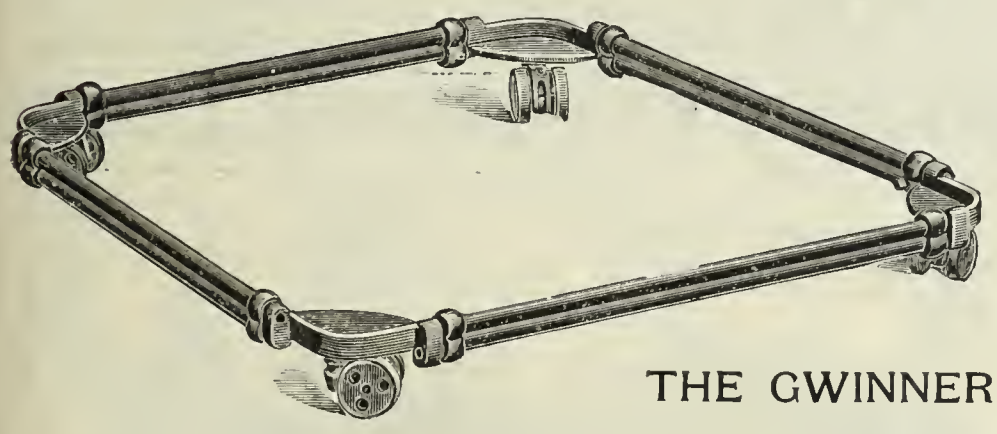
OR RANGE OR RAISE THEM HIGH FROM THE FLOOR.

PRICE, $16 Per Dozen.

It is literally out of sight, and consequently does not detract from the appearance of the stove or range upon it or make them look awkward or ungainly, as all other trucks do.

THE S. M. HOWES CO., - - 40-46 Union Street, Boston, Mass.

COMMON SENSE STOVE TRUCKS



Are easily and quickly adjusted to carry any stove. Made of wrought and malleable iron, will last a lifetime. Every stove dealer needs them. For Catalog and Special Discounts address

THE GWINNER MANUFACTURING CO.,
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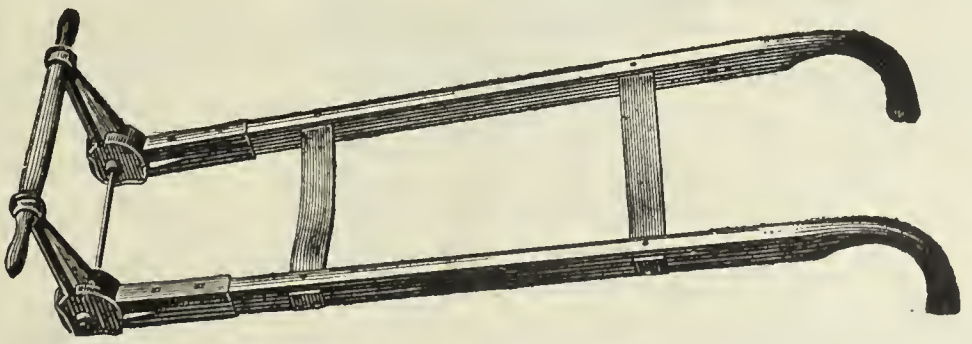
Stove Truck
AND
Carrier
MADE IN THE BEST MANNER
SEND FOR PRICE.



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ARCADE DAMPER, POKERS AND LIFTERS.

From latest improved patterns and designs.
Don't fail to get our Prices and Samples.

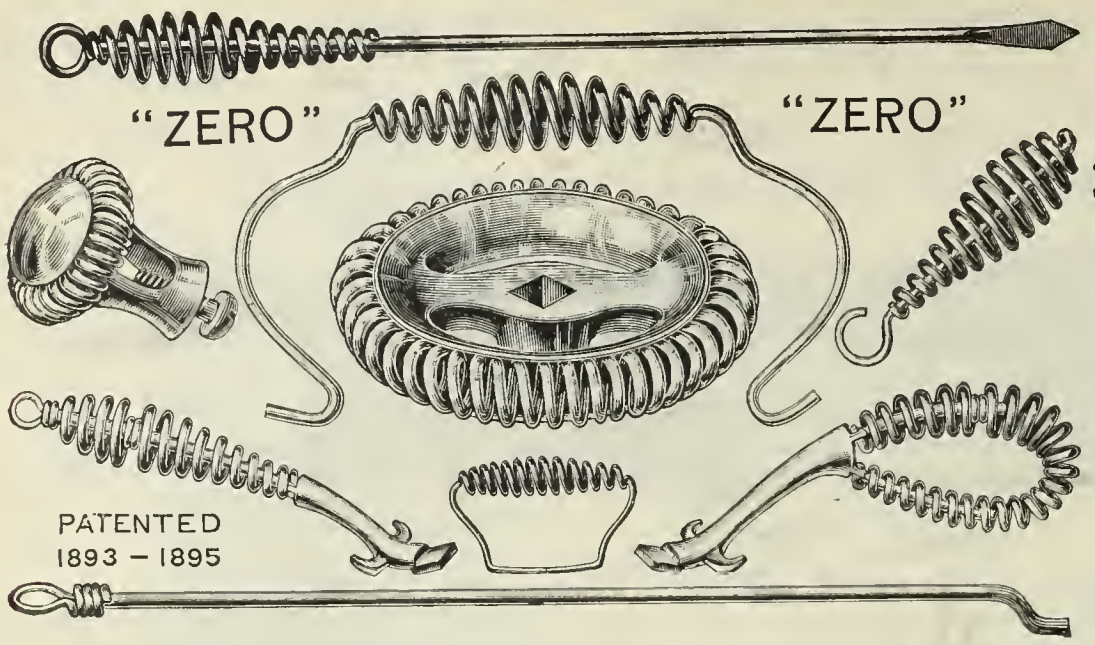
Our goods are up to date in all points
Satisfaction guaranteed.
Manuf'd by
ARCADE MFG. CO.,
Mfrs. of High Grade Family Coffee Mills and Hdw. Specialties,
FREEPORT, ILL.

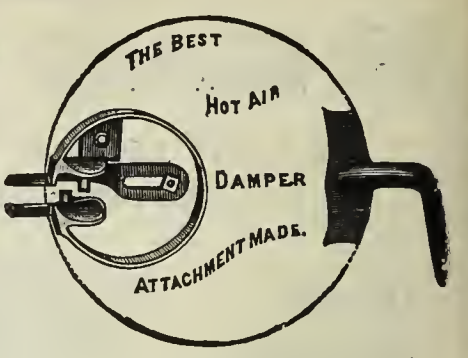
—A BRAWNY SWEDE visited the City Hall the other day to procure a marriage license, and a couple of clerks to whom he innocently stated his wishes directed him to the department where dog licenses are issued. He approached the license window diffidently, gave his name and address and asked what the document would cost. "It will cost you $1 a year for every dog you keep," replied the clerk.

"Dog?" echoed the Swede.

"Why, certainly," continued the clerk, "don't you want a dog license?"

"Val, no," cried the would-be benedict. "Ay kaint afford to buy a dog dees yar. Ay vant to get only a vooman now."—*Chicago Times-Herald.*





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WIRE GOODS.

Manufactured By

W. F GREENE,

TROY, N, Y.

American

WAFFLE IRONS.

The Best for Gas or Gasoline Stoves. Easy to Clean. Long Wood Handles.

Buy no Other.

"ERIE" HOLLOW WARE

ALSO COMPLETE ASSORTMENT OF

Full Nickel Plated Ware,

UNSURPASSED IN FINISH.

"ERIE" ALUMINUM CAST WARE,

The finest ware ever made. It will pay you to handle it.

New Goods for Spring Trade. Send for New Catalogue.

Try our Improved Double Broiler for Gas or Gasoline Stoves.

GRISWOLD MFG. CO., Erie. Pa.

New York Warerooms, 294 Pearl Street.

American Dampers and Clips are the Best

in every particular, Wood or Nickel Handle. Write for prices, and

BUY ONLY THE AMERICAN

—A REMINISCENCE.—Says an old New York merchant: "When the late Alexander T. Stewart set out to destroy rivalry in trade he succeeded in doing it. I remember one incident which illustrates my point. Thirty years ago, when Mr. Stewart had just finished his big building on Broadway, which occupies an entire block, bounded on the east by Fourth avenue, on the south by Ninth street, and on the north by Tenth street, his success aroused the envy of a Chicago man named Sherwin, who came to New York with the avowed purpose of running out A. T. Stewart. So Sherwin hired a big store on Fourteenth street, west of Broadway, extending through to Thirteenth street, which he fitted up 'regardless of cost,' and christened 'The Maison d'Or,' meaning the 'House of Gold.' Mr. Stewart watched these preparations grimly. When Sherwin was finally ready to open his doors to customers he was permitted to enjoy one day of uninterrupted trade. But the next morning he saw the crowds rushing past his doors and flocking to A. T. Stewart's big store. What was the reason? Nothing, except that Mr. Stewart had reduced his prices 33 1-3 per cent. on everything in his great mart. And this, mind you, was in 1867, when we were in the flush of war prices. Poor Sherwin was forced to follow suit. But he had bought when things were high, and was so poorly prepared to sell when things were cheap that at the end of eight days he was compelled to shut up shop. Then Alexander T. Stewart smiled sardonically as he directed his subordinates to add one-third to the price of each article offered for sale. Nothing more was heard of Sherwin in New York City."—*The Buyer.*

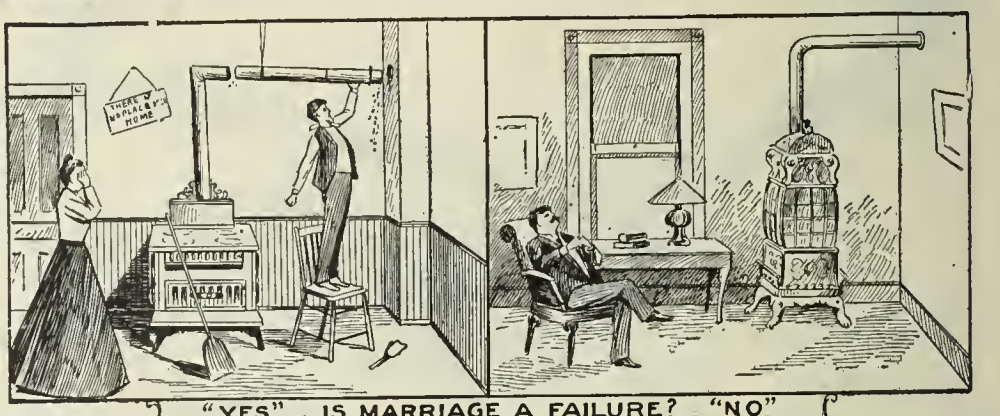
"MY GOOD MAN, do you ever do anything to bring light and purity into the homes of your fellow-men?"

"Yuss, lots."

"You distribute tracts?"

"No; I cleans windows and beats carpets."—*Illustrated Bits.*

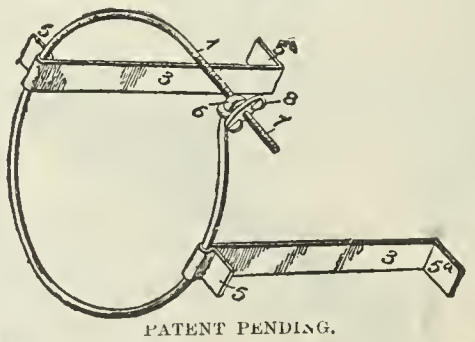
WEST'S STOVEPIPE LOCK



"YES" IS MARRIAGE A FAILURE? "NO"
TO BE HAPPY USE WEST'S STOVEPIPE LOCK.

Locks both ways—from pushing in—from pulling out. You can order them from any of the following well-known jobbers:

SIMMONS HARDWARE CO. (Inc.), St. Louis, Mo.
WYETH HDW. & MFG. CO., St. Joseph, Mo.
RICHARDS & CONOVER HDW. CO., Kansas City, Mo.
THE A. J. HARWI HDW. CO., Atchison, Kans.
GREAT WESTERN STOVE CO., Leavenworth, Kans.
HILDEBRAND HDW. CO., Indianapolis, Ind.
GREER & LANG,
GEO. W. JOHNSON'S SONS, Wheeling, W. Va.
THE GEO. TRITCH HDW. CO., Denver, Col.
HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ills.
THE W. BINGHAM CO.,
THE McINTOSH-HUNTINGTON CO., Cleveland, Ohio,
STANDART BROS., Detroit, Mich.
THE STOLLBERG & CLAPP CO., Toledo, Ohio.
THE SMITH BROS. HDW. CO., Columbus, Ohio.
THE F. H. LAWSON CO., Cincinnati, O.
STRATTON & TERSTEGGE, Louisville, Ky.
LOGAN-GREGG HDW. CO.,
DEMMLER BROS.,
GRIER BROS. (Limited), Pittsburg, Pa.



PATENT PENDING.

DIRECTIONS FOR USING.

Place the arms 3 in flue hole, leaving lugs 5 and ring 1 close to outside surface of chimney, insert stovepipe as usual. As stovepipe enters flue hole, lug 5a catches on inner surface of chimney. Turn thumbnut 8 until ring 1 is tight around pipe. Push collar to accustomed place and the entire lock is out of sight.

Packed, 1 doz. in nicely labeled box.

Send in your orders at once. Set the pace rather than follow the other fellow. The cost is but a trifle.

No more cussing on account of stovepipe.

The jobbing trade supplied by

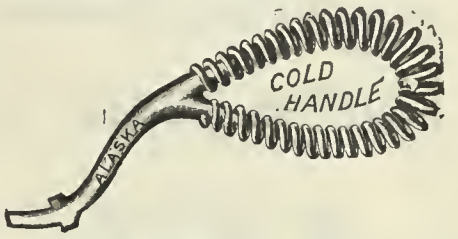
M. B. KERR,

Sole Mfr.,

Box B, Winfield, Kans

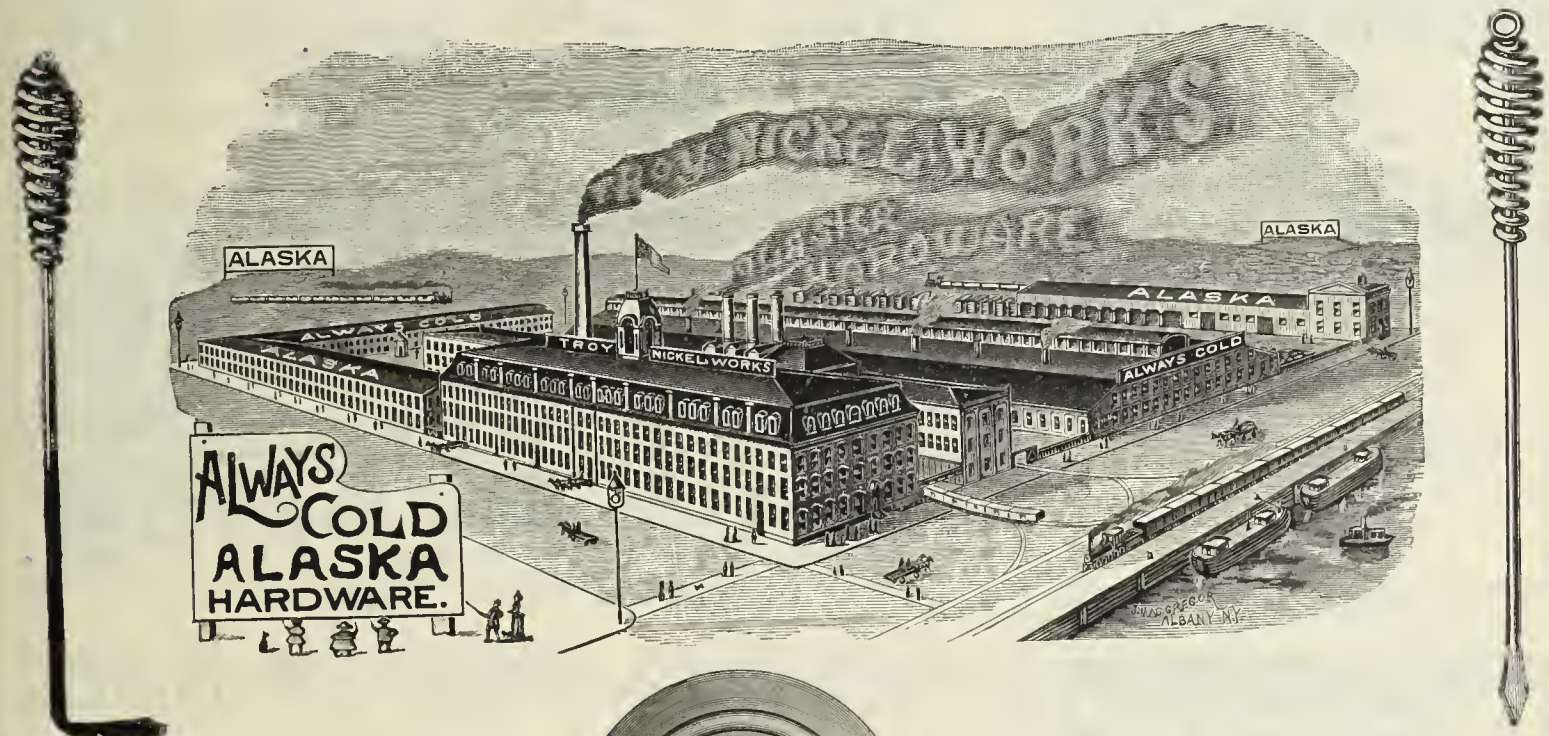
...ALASKA...

All good things are imitated.
Buy the original and
GET THE BEST.



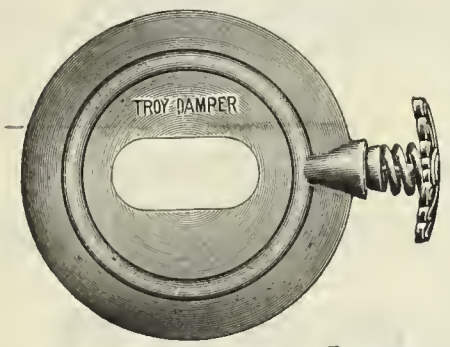
STOVE

Lid Lifters, Pokers, Shovels, Fire Sets.



PIPE

DAMPERS.



This is not as old as other Dampers, but it's getting there just the same, and re-orders proclaim the fact that it's liked by the users. Made in all sizes. "Handle Nickel Plated."

KNOBS.

TOWEL RODS.

N. B.—Having bought the entire line of Patterns of Perry Stove Co., we are in position to furnish *ALL REPAIRS* for this make of Stoves.

SEND ALL ORDERS TO US DIRECT.

TROY NICKEL WORKS,

ALBANY, N. Y.

WHEN YOU NEED
STOVE LININGS
Try ☞
Will not Clinker.

FIRE STONE.

Presbrey
Stove Lining Co.,
Taunton, Mass.

Stove Dealers!

ASK

THE

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to line your stoves with the **BEST LININGS.** A set of our linings in a stove greatly enhances its value.

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CATALOGUES NOW READY.

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Line of Stove
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WATER FRONTS for all
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A FULL LINE FOR ALL MAKES OF
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AND ALL OTHER PARTS. ORDERS SOLICITED.
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Lightning Stove Polish
"ALWAYS READY FOR USE."
Is a quick acting, paste polish; gives a jet black, glossy finish **instantly**; will not slop or spill. **No brush** is necessary, and consequently it will not spatter. No smoke, no smell, no dirt, no ruined carpets. Put up in 5c. and 10c. boxes. Write us for prices.
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Full Line of Stove, Range and Furnace Repairs

For all Pennsylvania makes.

New Era Oil Heating Stoves,
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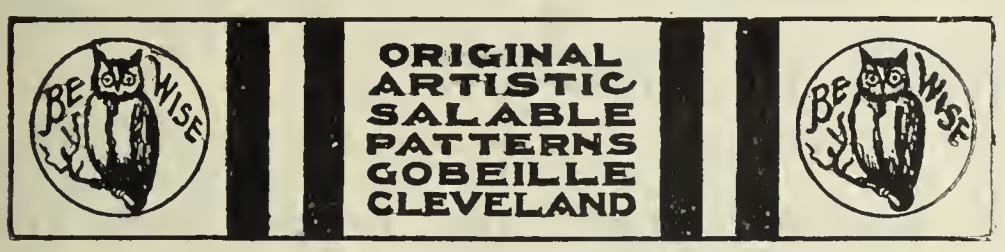

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Stove Pattern Works.

Original, Artistic and Practical Construction.
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PATTERNS
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SOLD BY ALL
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The Lawrence-Letts Elbow Co., Ltd.,
Sole Manufacturers,
WAVERLY, N.Y.

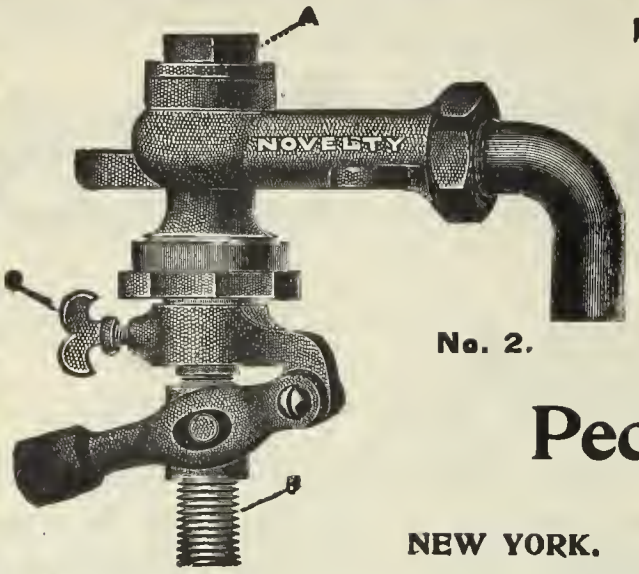
Our Specialty is Fine Stove and Range Castings. Pattern Castings Made, Filed and Fitted.

Cleveland, O.

—His Eye Teeth.—"Abner," said the good wife, "I wish you would stop at the store and git me a rubber ring for the baby to cut his teeth on."

"S'posen you give him that there gold brick in the cupboard?" said the farmer, with a grim smile. "It worked all right with me."—*Cincinnati Enquirer.*

—A man in Lewiston, Me., where bicycles are taxed, refused to pay a tax on his bicycle because it is worn out and useless. He demands to know of the assessors whether they could tax a man for a dead horse. If not, he wishes to know why he should pay for a dead bicycle, with a punctured tire.—*New York Tribune.*



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The Novelty Ball Cock

(PATENTED).

Top Supply. Made also for Bottom Supply. Noiseless. For High or Low Pressure. Easily Repaired. Write for Prices.

MANUFACTURED ONLY BY

Peck Brothers & Co.,

NEW HAVEN, CONN.,

NEW YORK. BOSTON.

The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating or Welsbach burners.**

It is a modern, perfected apparatus, warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adjustable burners. Send for catalogue.

C. M. KEMP MFG. CO.,

BALTIMORE.

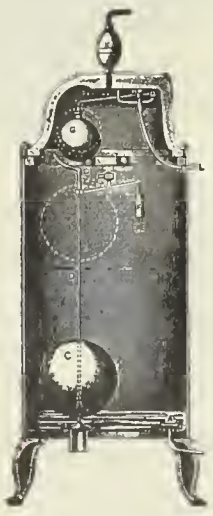
Leather and Rubber WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.

Patented Dec. 4, 1894.
Patented Oct. 15, 1895.



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I. X. L. Automatic Beer Pump.

Every Pump Guaranteed

Makes from 13 lbs. to 15 lbs. of air pressure in 4 minutes with one discharge of 10 galls. of water.

NOTHING TO GIVE OUT.

Muddy Water Don't Affect It.

The best, the most reliable, and the speediest pump on the market.

Very economical where water is supplied by meter system Send for a circular. Agents wanted.

THE I. X. L. BEER PUMP CO.

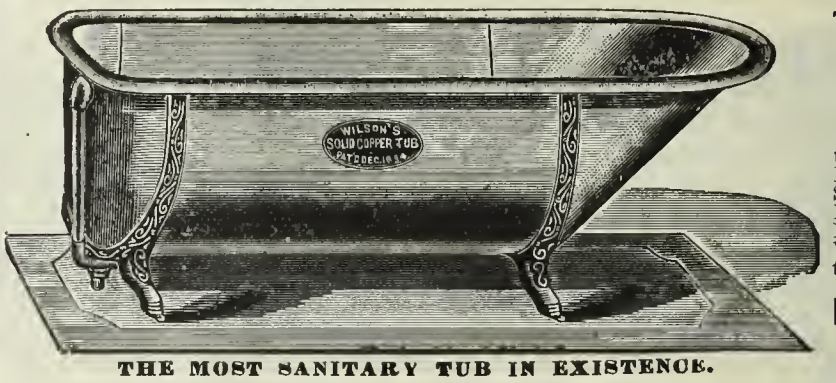
Sole Manufacturers,

1015 Christian St., PHILADELPHIA, PA.

TIME IS MONEY!

Therefore waste no more time in looking further when we have just what you want,

A Double Seamed Solid Copper Bath Tub,



THE MOST SANITARY TUB IN EXISTENCE.

The only one upon the market.

Send for illustrated Catalog of Bath Tubs, Tanks, Seats, Copper Range Boilers and Plumbers' Brass Work. Manufactured by

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THE KELLY Self-Acting Frost-Proof, After-Flush Closet.

For Extreme Cold Places and Out of Door Work.

When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

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201 Madison St, Chicago,

Manufacturers of Permanent Plumbing Goods

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Broughton Self-Closing Basin Cock.

No exposed working parts.

Every intelligent plumber will appreciate this.

The Broughton work has been in use many years.

Unsurpassed for strength and durability.

Every one warranted.

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Factory at Brightwood. SPRINGFIELD MASS.

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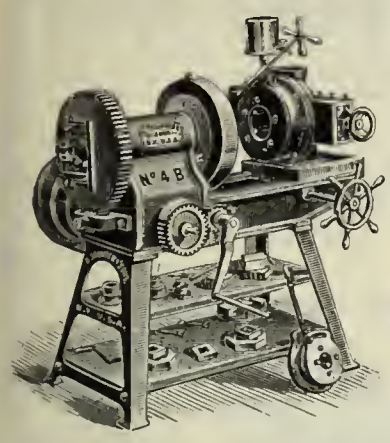

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All sizes ¼ inch to 18 inch for Pipe Mill, Gas and Steam Fitters' use. Tapping Machines for steam-fittings, also

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Any lathe converted into a power pipe machine at a moment's notice.

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COUNTS LIKE A

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Chain CANNOT Become Detached.

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DESIGNED FOR THE SUPPORT OF ROUND TRAPS.

Combines Strength, Neatness and Durability. Made of Iron, Neatly Japanned.

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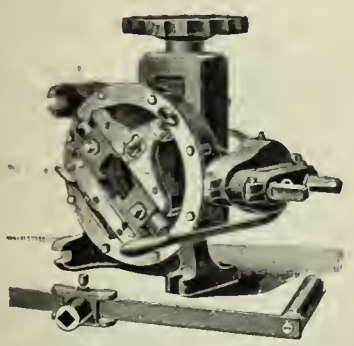

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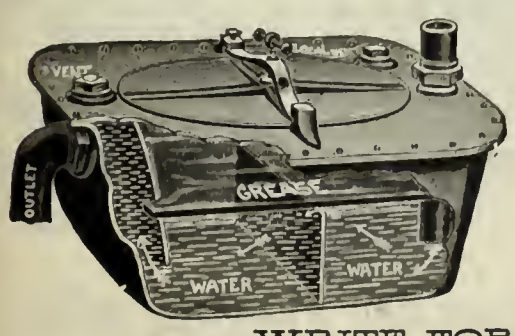

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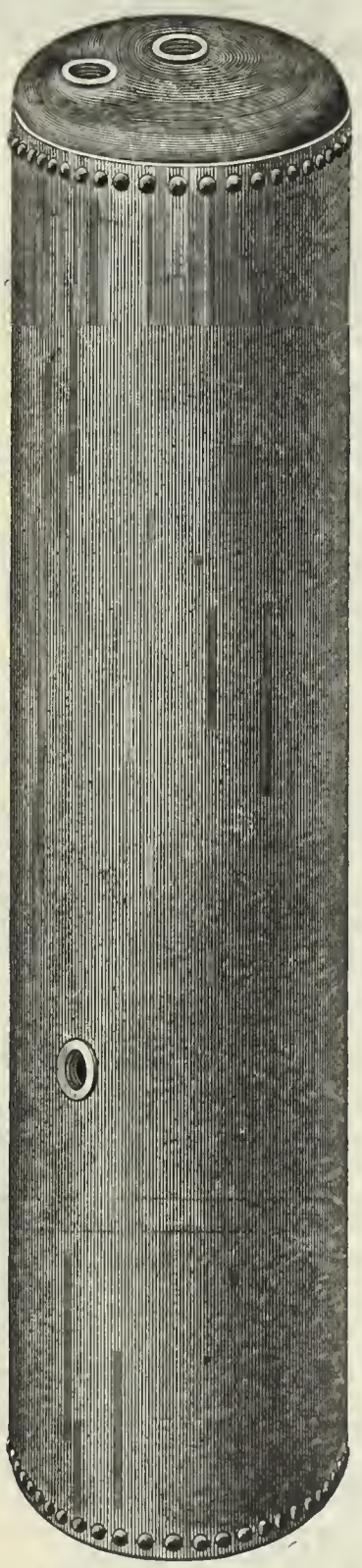

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GALVANIZED RANGE BOILERS.

We operate a complete and extensive plant for the manufacture of Range Boilers, Expansion Tanks, etc. We do our own *Galvanizing*, make our own *Rivets*, and do the drawing-up work of the heads; our customers can therefore rely upon getting a first-class high grade Boiler. It is the best made. We make these Boilers in all sizes, from 18 to 192 gallons capacity; also Boilers with Galvanized Iron Steam Coils inside (horizontal and vertical), Boiler Hangers, stands and Brackets.

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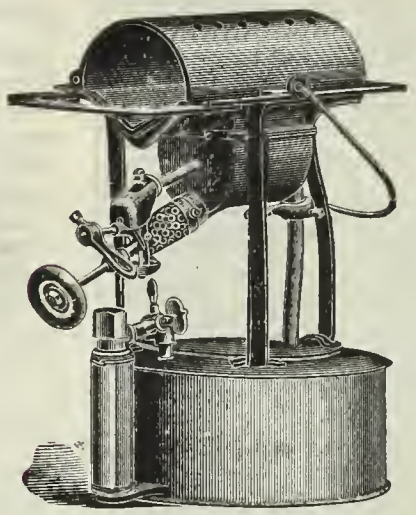

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Send us your address, and in return we will send you a catalogue of the best line of specialties in the United States.

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(Cut Shows Rope Handles and Re-enforced Bottom.) PATENTED 1896

Corrugated Galvanized Iron Basket.

Corrugated in such manner as to STIFFEN and STRENGTHEN it in Every Direction.

Making it the STRONGEST and MOST DURABLE Basket Known.

Made in any Shape, Size or Style to suit your wants.

Will send sample (1 bushel size) prepaid on receipt of $1.00. Write for our prices.

MANUFACTURED BY

THE METALLIC BASKET CO.,

123 South First St., Cedar Rapids, Iowa.

Complete Labor Saving. A sure means for estimating correctly and Avoiding Loss.

THE

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FOR PLUMBERS.

OFFICE EDITION, 100 *COMPLETE ESTIMATES,* $2.00.

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BATH-TUB SEAT.

Our Patent Detachable Galvanized Iron Bath-Tub Seat, in three sizes, will fit any galvanized wash tub. Seats are guaranteed to hold a weight of 300 pounds. Tub and Seat complete retails at $1.50, with 50 per cent. profit for the dealer.

SEAT FOR BATH TUB
THIS HURTS AND THE WATER SPLASHES ON THE FLOOR.
WHY DON'T YOU BUY A SEAT LIKE MINE
WITHOUT SEAT ATTACHMENT.
WITH SEAT ATTACHMENT.

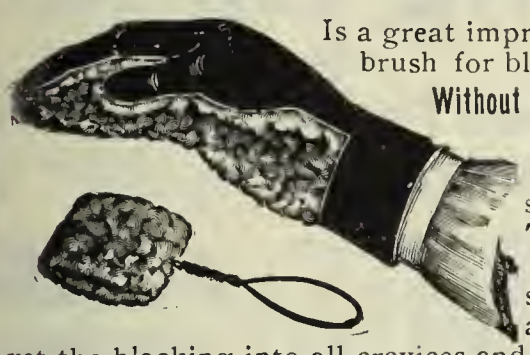
The legs fold and seats are shipped nested in boxes, not less than half dozen to a box.

H. WETTER MANUFACTURING CO., MEMPHIS, TENN.,

SOLE MANUFACTURERS.

Keep Your Hands Clean.

THE PARKS STOVE POLISHING MITTEN AND DAUBER



Is a great improvement over the old stove brush for blacking stoves.

Without getting a speck of blacking on hands.

The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth. **The Dauber** is also made of sheep skin, with the wool on, and so shaped as to readily get the b'acking into all crevices and corners. It is also adapted to polish russet and patent leather shoes, cleaning windows, furniture, etc.

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This is the Emancipation Proclamation that sells the

Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces.
Length, 10 inches. Can be sold in all seasons.

Write to Manufacturers for Prices.

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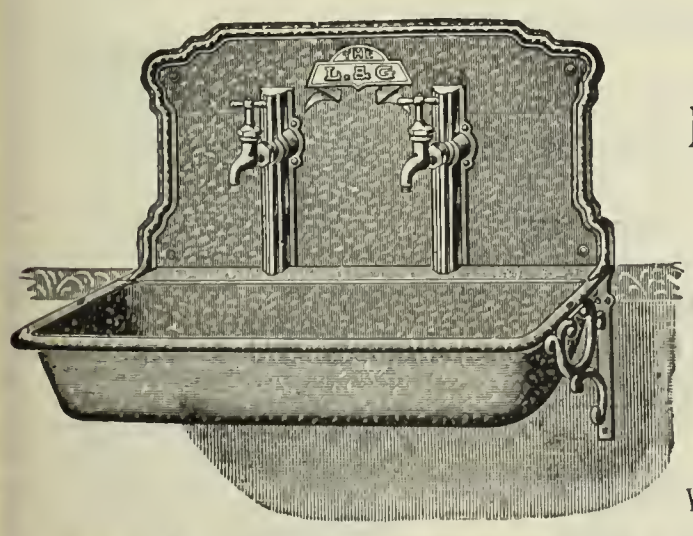

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SINKS

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SINK BACKS,

Painted, Galvanized and Enameled.

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NEW All Iron, Galvanized SAFETY COAL SIEVE AND COVER.

No wooden hoop or cover to break; will not rust, and is just the thing for HOT ASHES; and used on our **SAFETY ASH BARREL** is DUST PROOF.

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Also makers of a full line of Galvanized Sheet Iron Wares, Factory Fire Buckets, Oily Waste Cans, Garbage Pails, Chamber Pails, Coal Hods, Oil Cans, Ash Barrels, etc.

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HILL'S CHAMPION COOKER

A Steamless and Odorless Cooker with an Iron Base. Keeps the steam and odor from the house.

125,000 NOW IN USE.

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THE CENTRAL STAMPING COMPANY,

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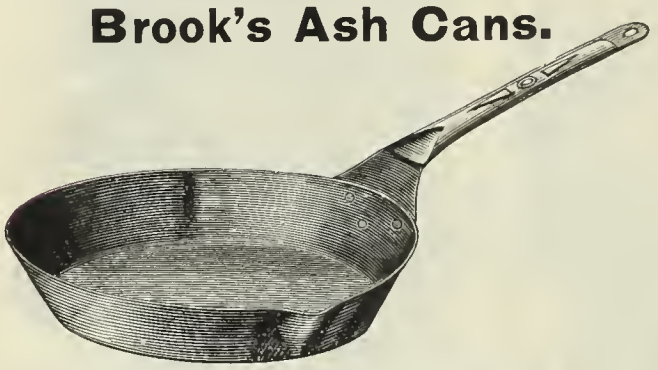


Latest Style of Cold Handle Fry Pans.

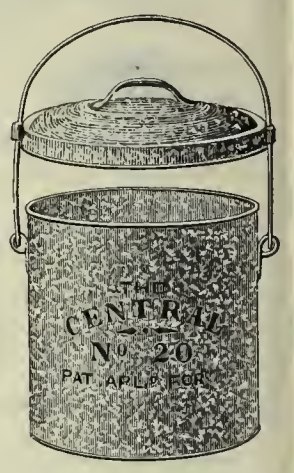
ARTICLES FOR

Kitchen, Farm, Dairy, Table, Factory, Lawn, Stable, Cafe.

New Price List,
Send for Copy.

Proposals Invited.

LARGEST ASSORTMENT.
STANDARD GOODS.



New Ash and Garbage Can.
Cover Always Attached.

We Wish to Introduce to You Our New

"Family" Roaster and Baker . . .

Made from Black Smooth Steel.

Nos.	10	20	30
Inches	8½ x 12½	10½ x 15½	12½ x 17½

The "Family" Roaster and Baker is a well made double roasting pan, the upper part of which is ventilated.

The two parts are joined by a hook hinge, and when closed are held securely together by this hinge in the back and a tongue in front, which slips through a slotted clip that is riveted to the lower part.

Include a sample lot in your next shipment.

THE SIMPLEST AND BEST ROASTER MADE.

MANUFACTURED BY

KIECKHEFER BROS. CO., Milwaukee.

Sold by all Jobbers.

—A WAY OUT.—Irish Officer—Why were you late in barracks last night, Private Atkins?

Private Atkins—Train from London was very late, sir.

Officer—Very good. Next thime the thrain's late, take care y' come by an earlier one.—*Tit-Bits.*

—"You are charging me most horrible prices," complained the prospective Klondiker.

"It is just this way," said the Seattle merchant. "You either strike it rich or freeze to death; so, either way, you won't miss the money you are leaving behind."—*Pittsburg Chronicle.*

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This Post Maul was original with us. Imitations are made all over the United States. WE MAKE THEM RIGHT, from specially selected Pig Metal. One will do the work of a half dozen of the scrap-iron variety. If your Jobber does not give you Sperry's, order from us.

D. R. SPERRY & CO.,

HOLLOW-WARE FOUNDERS,

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TEA KETTLES, RANGE KETTLES, TEA AND COFFEE POTS, WASH BOILERS, STOVE TANKS, &C.,

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800 Series. Tin Lined.

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Write for Catalogue and Prices.

ROME MEANS PERFECTION.

900 Series. Silver Lined.

ALUMINUM GRIDDLES.

MADE BY

The Illinois Pure Aluminum Co., Lemont, Ill.,

ORIGINATORS of ALUMINUM STAMPED WARE and Manufacturers of the ONLY COMPLETE LINE

THESE GRIDDLES WILL COOK CAKES WITHOUT GREASE.

INCLUDE A SAMPLE IN YOUR NEXT ORDER.

The oblong are made in two sizes; the round being made in four sizes. Prices within the reach of all.

Write for our ILLUSTRATED CATALOGUE with LOWEST PRICES of LIPPED SAUCE PANS and PRESERVING KETTLES, WHICH HAVE JUST BEEN REDUCED.

GOODS WELL MADE AND GUARANTEED

WAGNER

Extra Finished, Nickel Plated and Aluminum.

The most beautiful Kitchen Ware ever offered the trade in point of finish, lightness and durability. All live dealers sell it.

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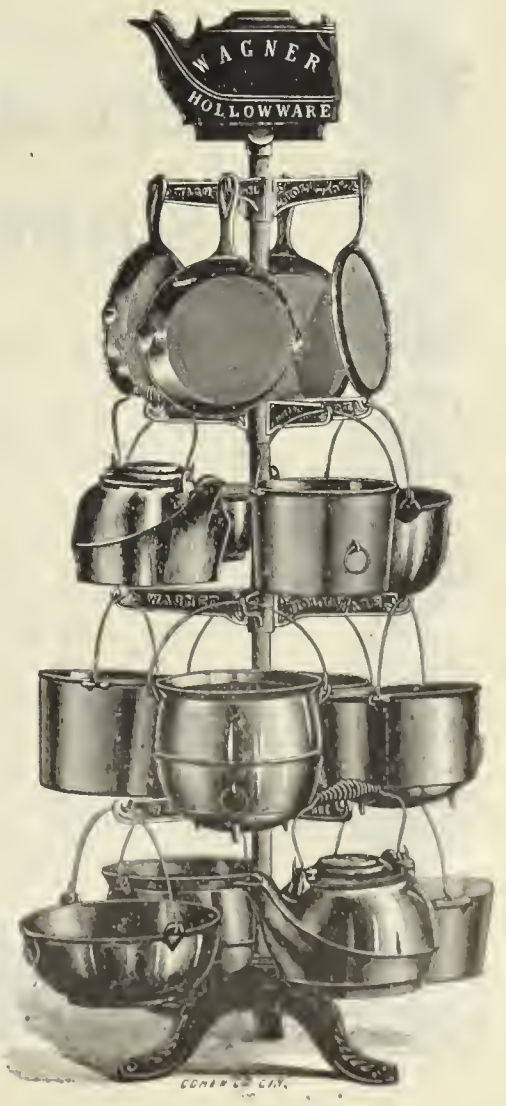
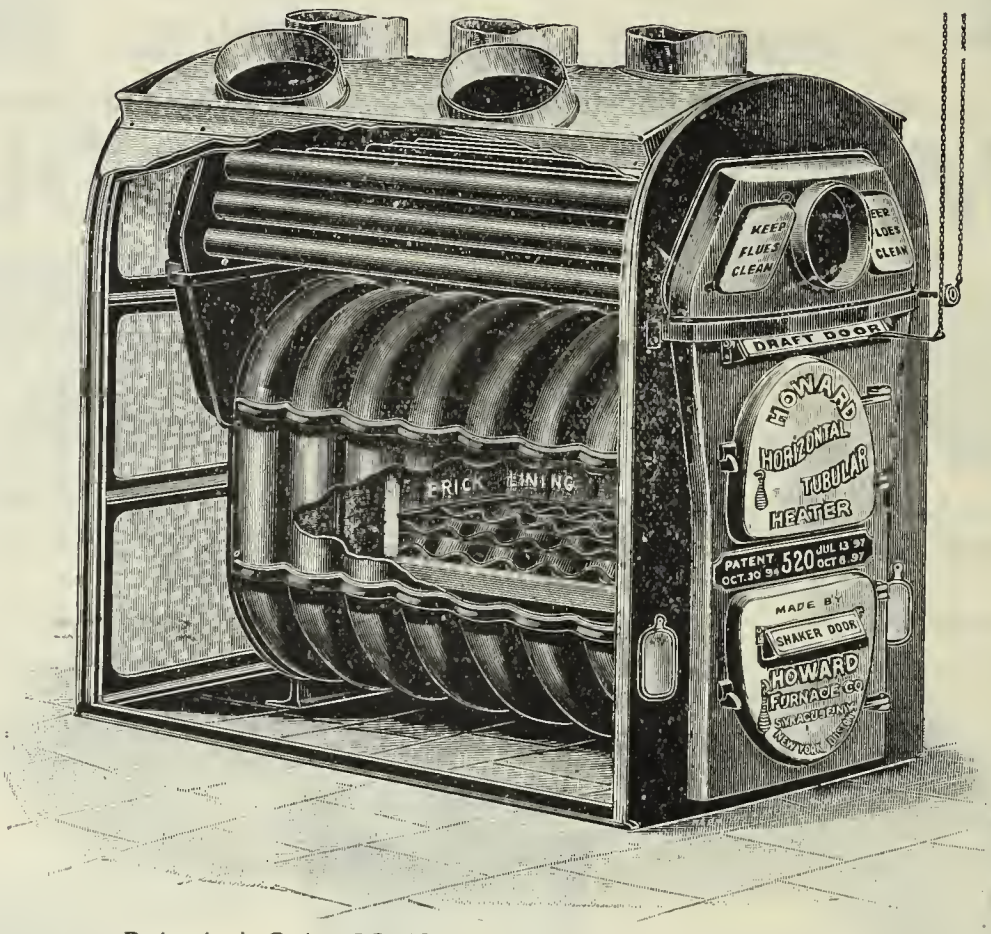
Do you? If not write for Cat. and Prices to

Wagner Manufacturing Co., - Sidney, O.

WARE.



Condemned Before Understood.



Patented: Oct. 30, 1894. July 13, 1897. Oct. 5, 1897.

There are always some people who

never see good in anything. They may be willing to be convinced, but they would like to see the man who can convince them. Just so about this furnace. It is something new, and for that reason it is likely to receive condemnation on many sides. That's all right. We are used to it. All we ask of any interested furnace dealer is to write us. If we fail to present a clinching argument that's our fault. So write us to-day.

Howard Furnace Co.,

Syracuse, N. Y.

NEW YORK OFFICE,
231 Water St.

BOSTON,
198 Spruce St., Station H (Chelsea).

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 16, 1897.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

BUSINESS OFFICES:

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BOSTON .....33 Mason Building.
PITTSBURGH .....Room 509 Hamilton Building.
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CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Commercial Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon Street, London, England

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The Business Situation.

The past week has been rather more quiet, in a business sense, than its predecessors, taking the general trade throughout the country. In a number of wholesale lines a diminished activity is noted, which is usual at this period of the year. Winter business is on the wane and merchants are hardly ready as yet to place orders for spring goods. Probably the volume of business will not total up as large a figure as has been reached in recent weeks. Nevertheless, reports from the retail trades show that manufactured goods are moving briskly into consumption, especially in the West, where the breaking up of the drought, with the occurrence of much needed rains, has stimulated trade considerably. Industrial activity in the country at large is also on the increase, and manufacturers generally are exceedingly busy filling orders and making up stock. Only in the South is there a decided check to the free interchange of commodities, owing to the yellow fever quarantine. Aside from this untoward incident, however, the influences governing business remain favorable. The Government reports of international trade show that exports from this country are breaking in volume and value every past record. The growth in this respect, moreover, is not merely in agricultural products, but in manufactured goods, which are going abroad to an unprecedented extent. Imports, at the same time, are shrinking and the trade balance in our favor is rolling up rapidly in consequence. As Europe has also begun to buy American securities gold must of necessity come over here in payment for foreign purchases. Over $6,000,000 of the precious metal is now in transit to our shores. Railway earnings show increasing improvement. The leading Northwestern lines report about 25 per cent. gain over a year ago, and the earnings of roads in all sections of the country are making an encouraging showing. In the iron and steel trade mills and furnaces are very active and the general tone is strong. Bessemer pig has reacted to a higher level during the week and prices of all finished iron and steel products are firm with an upward tendency. The metal market does not show much improvement, however, but has been dull, and weak in some lines, notably in lead, copper and tin plate. A sharp decline in the stock market has brought down values of standard issues from 3 to 4 per cent. this week. The market has again gone under "professional" sway. Money is still easy, but there is a considerably increased movement in commercial paper, banks buying very freely, while a large amount of good material is being offered. Collections are reported to be generally fair.

Business Failures.

A striking contrast between the conditions prevailing in the business world now and a year ago is suggested by the statistics of business failures for the quarter ended September 30 last. These show a very remarkable decrease to have occurred during the past three months, not only in the number of failures, but in the amount of the liabilities involved. According to the careful statements prepared by *Dun's Review*, the total liabilities of 2881 commercial failures in the United States during that period were $25,600,000, compared with 3757 failures, having over $73,200,000 of liabilities, in the third quarter of 1896. A more convincing demonstration of the improvement which has taken place in business conditions of late could hardly be furnished. Moreover, the returns show that the decline in failures was general throughout the whole country. In the New England States it was 45 per cent.; Middle States, 60 per cent.; Southern States, 55 per cent.; Central States, 80 per cent.; Western States, 60 per cent., and Pacific States, 10 per cent. The aggregate number of failures in the past three months was the smallest for any quarter since the third of 1892, and the lowest in any previous three months for 15 years, excepting six quarters, including one in each of the years 1885 to 1889. The average of liabilities for each failure, $8886, was the smallest in any quarter for the past 23 years, the nearest approach being $8922 in the first quarter of 1880. Taken in conjunction with the fact that the total of business payments through the banks of the country in September was the largest by $268,000,000 ever recorded for that month, these figures are eloquent of restored confidence and of a condition of business stability which is most gratifying.

Freedom from Labor Troubles.

Labor troubles in manufacturing establishments are not so serious as had been expected when business began to improve. The great body of workingmen undoubtedly prefer to be steadily employed, even if not entirely satisfied with wages schedules, rather than take chances of being out of work for an indefinite period. Small strikes are, of course, taking place here and there, but no great interests are involved, and they are usually precipitated by unskilled workmen whose wages are the lowest in the scale. It is certainly most gratifying that the resumption of activity has not been checked by disputes over the wages to be paid. If sliding scales could be made applicable to all employed in manufacturing establishments, a great deal would be accomplished in the avoidance of friction over wages. Participation in higher prices would then be a matter of certainty as soon as affairs changed for the better, and peace would at least be assured as long as markets were advancing.

THE LETTER BOX.

Power Required for Pumping.

From A. C. R., Marshall, Texas.—Please publish in *The Metal Worker* an answer to the following question: A stand pipe is located on a hill 2 miles from the pumping house and 115 feet above it. Water is pumped to the stand pipe through an 8-inch pipe at the rate of 350 gallons per minute. How much will the gauge in the feed pipe in the pumping room register—that is, how much pressure is required to force water through an 8-inch pipe 2 miles long at the rate of 350 gallons per minute? Will you also kindly publish the formula for figuring the above and for figuring the flow of water when the head, length and diameter are given?

Answer.—We find the friction, if the pipe line is straight or nearly straight, to be 13.48 pounds per square inch, and for the 115 feet head the static pressure is 50.05 pounds per square inch, making a total pressure of 63.53 pounds. This is subject to a variation of 0.43 pound for every foot of rise of water in the stand pipe above the 115 feet as stated. The friction of water flowing through pipes is obtained from the velocity and the diameter of the pipe. In our correspondent's case the 350 gallons must be reduced to cubic feet by dividing by the number of gallons per cubic foot, say $\frac{350}{7\frac{1}{2}} = 46.6$ cubic feet. The area of the pipe, 8 inches, is 50.26 square inches, and by the rule $\frac{46.6 \times 144}{50.26} = 133.51$ feet per minute and $\frac{133.51}{60} = 2.22$ feet per second, which is the velocity required in the formula.

Then by the formula of Weisbach $\left(0.0144 + \frac{0.01746}{\sqrt{v}}\right) \times \frac{l}{d} \times \frac{v^2}{5.4}$ = hight or head in feet required to overcome friction of flow. The figured formula then becomes $\left(0.0144 + \frac{0.01746}{1.49-}\right) \times \frac{10,560}{8} \times \frac{4.928}{5.4} = 31.35$ feet $\times 0.43 =$ 13.48 pounds per square inch friction.

The formula for the discharge in cubic feet per second is $\sqrt{\frac{d^5 \times h}{l}} \times 4.71$ = volume in cubic feet per second; d^5 is the fifth power of the internal diameter of the pipe in inches, h = hight of head in feet and l = length in feet, so that with an open end in the force pipe at the pumping station the figures will be $\sqrt{\frac{32,768 \times 115}{10,560}} \times 4.71$ = 90 cubic feet per minute, or 675 gallons per minute would be the free flow from the stand pipe through the pumping line.

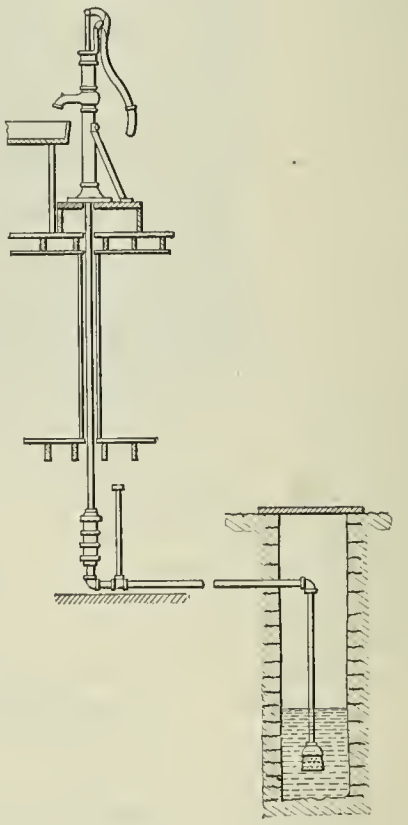
Material for Chimney Cap.

From C. S. G., Clear Spring, Md.—I would be glad to learn what is the best material to use to cover the top of a house chimney, as the gas from hard coal eats it up very rapidly. Would zinc be better than galvanized iron?

Note.—The acids formed by the condensation of coal smoke are often very destructive, and in some cases galvanized iron gives very unsatisfactory results. Zinc, under the circumstances, would be somewhat better, as there would be no coating to eat off and the material would endure until the entire body of the zinc was destroyed. In the case of galvanized iron, even supposing the coating to be uninjured in making the chimney top, there is so thin a surface that it would quickly corrode through to the iron itself, and that of course would not offer very much resistance to the acids. We would like to ask our correspondent if it has ever occurred to him to make a chimney cap of heavily coated terne plate, using one of the hand dipped plates carrying a thick coating of lead and tin, or using leaded plates? A heavy gauge metal coated in this way ought to give better results in such a place than metal coated with zinc, as lead is not influenced by sulphurous and sulphuric acids, which are sometimes carried in coal smoke, in the way that zinc and iron are. Of course, the best cap would be of terra cotta, but our correspondent evidently wants to use sheet metal.

What Pump Should Be Used?

From C. F. B., Guilford, Conn.—I wish to inquire through *The Metal Worker* what would be the best kind of pump for raising water from a well to a kitchen sink in the second story? The upright distance is 29 feet 6 inches and the horizonal distance is 45 feet. It must be made to operate easily and noiselessly. A 1¼-inch iron pipe is to



What Pump Should be Used?

be used. What style of pump is best to employ and how should it be set?

Answer.—In a pumping plan for a second story the pump body and handle may be set on a pedestal at a convenient hight for discharge into the sink. The bucket and valve chamber should be located in the cellar directly under and connected to the pump body with a 1½-inch pipe.

The bucket and handle shank should be connected with a half inch pipe to prevent the pump rod from vibrating and touching the outside pipe to make a noise. The pipe leading from the well should have a slope downward toward the well of 3 or 4 inches in the 45 feet, to allow the air to gravitate toward the pump. It should be laid below frost line or not less than 4 feet in your climate. The suction pipe entering the cellar at this depth will give ample room for the cylinder containing the bucket and suction valve to be connected to the vertical pump pipe and rod.

A tee piece with a short vertical pipe should be placed in the suction line near the pump cylinder for charging the suction pipe with water to start with and for recharging should the water run out by leakage of valves. This pipe also makes a suction air chamber and must be capped air tight after charging.

There should be attached to the end of the suction pipe a good leather seat foot valve and strainer, to be placed deep enough to be submerged when the water runs low. The well pipe should also be protected against frost, and all pipes should be of galvanized iron—pump chamber and buckets preferably of brass. We have designed the plan of a pump for a house with a cellar, but if there is no cellar beneath the place where the pump is to be located, the suction may be turned up to the first story floor and the arrangement made on that floor that is represented in the cellar. We cannot advise putting the pump bucket chamber on the second floor. It is too high a lift for the best operation of the pump, and would cause much trouble in keeping the charge. For a better finish in the first story or for protecting the pipe from frost, it may be belted and boxed, which will also make it noiseless from any jarring of the pipe when pumping.

Acids for Dissolving Iron.

From Walter B. Burrow, Norfolk, Va.—I notice in *The Metal Worker* of September 11 an inquiry from "Subscriber," Reading, Pa., asking for an acid to dissolve iron. I had occasion to reduce some iron wire to a diameter of 15-100 inch, and used the following mixture to accomplish it: Gallic acid (crystals), 10 grains; nitric acid c.p., 1 ounce. Prepare by shaking into a uniform mixture. Paint or rub the mixture on the iron or steel evenly; allow it to partly dry. Wipe the metal and apply until the desired thinness is obtained. The gallic acid may be increased a little if desired. It would be well to wear gloves during the operation, as gallic acid and nitric acid make an almost indelible stain on the skin. The above worked very well with me.

Paint for Galvanized Iron.

From J. H. C., N. Y.—Noting the inquiry of "Tinner" in *The Metal Worker* of September 25, I am somewhat undecided as to whether the character of the material on which the galvanizing is put is not responsible for the action of the paint. A great deal if not all of what is supposed to be galvanized iron, as sold to-day, is galvanized steel, and I know from using it in smoke pipe for furnaces that the galvanizing does not adhere to the steel with anything like the tenacity with which the galvanizing adhered to good refined and best bloom iron of two decades ago. This, however, is another question, for heat is an important factor in these conditions. For outdoor work the galvanizing may adhere to the steel with sufficient tenacity and this factor may be unimportant. I have made ventilators for churches and other buildings, of both zinc and galvanized iron, and in some instances these have been of an ornamental character and naturally had to be painted, and I have never had any trouble with paint peeling either from the zinc or galvanized iron ventilators when good materials were used. It has always been my custom to use the best materials I could find, and have found that boiled linseed oil is the best for outside work. Also that white lead of the best quality should be selected. It may not be generally known that there is a wide difference in white leads. What is known as the old Dutch process is the best if it is not adulterated but remains free from impurities. The test for impurities is to place a quantity of lead on a piece of lighted charcoal, and then with a blow pipe reduce the white lead to a molten state. If the lead all melts and runs off it may be looked upon as pure, while if it is impure a cinder will be left. Any coloring matter that may be used should be ground fine, and not used unless it is ground fine. If the painting is done with these materials and care is taken in the selection of materials, I think there will be little trouble with the paint standing.

From H. R. S., St. Louis.—I notice in *The Metal Worker* of October 2 a number of letters relating to the best paint for galvanized iron, and would like to call your attention to the Donkey paint made by the Kansas City Roofing & Corrugating Company, as a covering proof against moisture, acids, alkalies, ammonia and fumes from coal smoke. In using it it is desirable that the surface to be covered be completely free from grease, and all rust spots ought to be cleaned off thoroughly with a steel brush.

From W. H. M., Salem, Ohio.—I note the recent correspondence in *The Metal Worker* regarding the best paint for galvanized iron. We have found the best paint for painting any metallic surface is one composed of the best quality of red lead and linseed oil. This is what is specified by the United States Government and several of the foreign Governments, and we have always found it very satisfactory.

Trade School for Cornice Work.

From S. F. E., Sedalia, Mo.—Will you please tell me in the Letter Box if there are any trade schools in the West where I can learn cornice and sheet metal work?

Note.—We do not know of any schools in the West where these trades are taught, but we should be very glad to hear from any of our readers who can give us information on this point. The New York Trade School, 1260 First avenue, New York City, has a course such as our correspondent is looking for, and sheet metal work is also taught by the International Correspondence Schools, Box 968, Scranton, Pa.

Finger Marks on Planished Iron.

From Spokane, Wash.—"H. B.," Colfax, Ill., asked in *The Metal Worker* of September 25 how to remove stains and finger marks from planished iron. The prevention is all right, but every one is liable to a mishap occasionally. If "H. B." will use cut acid to rub on the marks and then dry by rubbing on commercial window whiting, I think he will look twice to locate the spots when through.

Brass and Copper Manufacturers at Rome, N. Y.

The Rome Brass & Copper Company, Rome, N. Y., are fitting up the addition to the copper mill built last summer with machinery, and in a short time expect to have it in operation.

The business of the brass and copper mills has almost doubled in six years. In 1891 the number of employees was 256; now it is almost 500. Repeated additions have been made to the plant in that time, until now both sides of Bouck street, from Dominick to the Central Railroad, are solidly lined with buildings. A large addition to the brass mill was built the past summer, and the steel framed addition to the copper mill, which was built last year, is one of the model factory buildings of the country.

The manager, J. S. Haselton, is investigating natural gas, and two wells have already been sunk under his direction, while a third has just been commenced at his residence.

Six years ago the Rome Mfg. Company's factory and R. M. Wilson's bathtub works, both of which are heavy customers of the Rome Brass & Copper Company, were not in existence. Now the bathtub works have an immense plant of their own, with a new department for making enameled bathtubs, and employ 125 hands. The Rome Mfg. Company have a model plant and the very best machinery, and can compete with any factory in the country. This concern use gas from the first well put down in Rome for brazing and lighting, without visibly affecting the supply. Mr. Wilson will have a well on the premises of the bathtub works before another season is over.

The announcement is made that acetylene gas is at last to be furnished on a commercial basis to the citizens of Chicago. A corporation has been formed, with a capital stock of $1,000,000, under the name of the Acetylene Gas Light & Fuel Company, which is backed by capitalists interested in the leading gas company of Chicago, and it is stated that pipes are to be leased from that company which are not at present in use but had been secured when rival gas companies were bought out.

THE COMPETITION AGAINST ANTHRACITE COAL.*

The optimist as to the future for anthracite coal has adopted a creed which begins : "There is only one coal, and anthracite is its name." There is as much self satisfaction derived from its utterance as the Moslem receives from a somewhat similar expression of his views as to religion. The anthracite "faithful" cannot see any future danger in the rapid growth in the use of gas for domestic purposes, in the possibility of an increase in the consumption of coke for domestic and manufacturing use, in the increasing displacement of anthracite by the lower priced bituminous coal, in the growth of steam heating plants, or in the more distant but none the less possible use of electricity for heating as well as for lighting and power.

It is argued that much of the gas that is replacing the domestic sizes of anthracite is made from hard coal and that, therefore, the decreased tonnage from this cause cannot be great. While it is true that anthracite is largely used for this purpose, it is also true that from each ton of such coal there are produced over 30,000 cubic feet of gas, and when this is used for domestic purposes each 5000 cubic feet replaces about 1 ton of anthracite. Further, the only reason why anthracite is thus employed is because it is cheaper than coke, and if at any time, through the more general use of by-product ovens, which produce a far cheaper coke than the beehive form, this fuel is reduced in cost to or below the price of anthracite, either it will replace the latter for gas making, or hard coal must be sold for a lower price. Still further, it is a matter of fact that in various cities, especially in New York, nearly all of the modern apartment houses are constructed without any provision for a coal stove. Steam heat warms the rooms, and the kitchens have gas ranges. It is being found more difficult each year to rent the old style apartments unless these improvements, gas and steam, are introduced. Gas is being largely employed for power in the cities, and no better illustration of the manner in which it is superseding hard coal can be mentioned than the fact that at some wharves in New York, where anthracite is unloaded from barges, the power is furnished by gas engines. As showing the result of the greater consumption of gas for cooking, compare the present value of the securities of the gas companies with their value ten years ago. Such a comparison shows that notwithstanding the decrease in the selling price of gas and the competition with electricity, there has been such a great increase in its consumption as to maintain, and in many cases largely increase, the value of the producers' securities. The same cannot be said of the anthracite interests.

THE USE OF COKE.

As to the possibility of an increase in the use of coke for domestic purposes, it is objected that this fuel costs more than anthracite at a distance of 100 miles from the ovens; that it is hard to burn, requiring special stoves, and that because of its friability there is a heavy loss in dust, both in transporting and handling. As a matter of fact the latter objection and the difficulty of first igniting hard coke are the only material reasons why it is not more largely used. In the Northwest, and at other points where there is a wide difference between the price of anthracite and coke, the latter, screened through 1½-inch and over ¼ or ½ inch mesh, is burned in ordinary stoves whenever a smokeless fire is wished, and gives thoroughly satisfactory results. Moreover, if, as is quite probable, future developments in the saving of the volatile products from bituminous coal lead to the manufacture of semi-coke, as is being done in England, this fuel will become a strong competitor, since, while friable and breaking easily to fine stuff and dust, it ignites readily and gives a clear, strong and smokeless fire. In its manufacture it has been found that the value of the products recovered by condensation is sufficient to repay the entire cost of the process and in great part the cost of bituminous coal used, so that the resultant coke, which becomes in reality a by-product, has almost nothing but profit charged against its cost, and consequently can be sold at an extremely low price. The by-product coke plant to be erected near Boston will likely produce coke of this character, using Nova Scotia coal, and it is quite possible that similar plants may be erected near other cities.

As to the inroads which it is known have been made into the anthracite market by soft coal, the optimists say that this year has been one of the lowest prices on record for bituminous coal, and since both railroads and operators are losing, such conditions cannot be expected to continue. And they claim further that it is only the smallest and least profitable sizes of anthracite which have been affected, and these in only a few markets. Proof is lacking, they say, to show that the hard coal market has been really affected, since throughout this year, even at the low price for soft coal, there has not at any time been an excess of the small anthracite steam sizes. This argument is good as far as it goes, but, like all half truths, that which it leaves unsaid changes the direction of the conclusion. It is true that this year has witnessed the lowest recorded prices for bituminous coal, but it is equally true that many of the contracts have been made to extend over a period of years. For years past there has been a steady decline in the price of this fuel, fluctuating, of course, from year to year, but with a general downward tendency. No person can say when this will stop and the price become stable. It was predicted only a few years ago, when the price of soft coal had declined until it sold for $3 per ton at tidewater, that no lower price would ever be taken. And this spring has witnessed $1.75 per ton at the same point. There is no guarantee that it will not go lower. It should not, certainly, but to say that it will not, or that it will increase and always hold a higher price, is a statement based on mere conjecture.

BITUMINOUS COAL.

It is the market for anthracite small sizes which has been mainly affected by the low prices of bituminous coal, though in the Northwest the domestic trade has suffered a heavy loss. The proofs that there has been a change from anthracite to soft coal by many steam users are numerous and easy to find. Every sales agent and commission house which handles anthracite can name not one, but many former customers who are now using soft coal, and who state that they are so pleased with the result that they will not again change. Another proof of the injury from soft coal is that the prices for the anthracite steam sizes have been declining, and even during the early months of this year, when they were scarce, the price received at tidewater was lower than in the latter part of 1896, when there was so great an excess that it had to be stocked at the mines.

Further, no account is taken of the improvements which are being made in stoves and ranges by which bituminous coal can be burned as a domestic fuel, without smoke. Exclusive of the East, there is a wide field in the South and West for such stoves, since there soft coal is used almost exclusively, and consequently inventors have a wide field open and are pushing into it. In the East, where anthracite is the generally accepted fuel, such stoves might not be looked upon with immediate favor, but it would not be long before a comparison between $5 anthracite and bituminous coal at half that price would induce the economical householder to arrange his furnaces for the cheaper coal. There are such stoves now made and they have been fairly successful, and the good results obtained have urged inventive genius to change and improve in the hope of a perfect success.

Steam heating plants have unquestionably caused a material decrease in the market for domestic coal. Those which, from choice or compulsion, use anthracite take the smallest sizes and in many cases use with it an admixture of bituminous coal. In large public buildings and residences the old style of grates and stoves burning egg and stove coal were replaced by large furnaces burning egg and broken coal in the basement, from which hot air pipes led to the various offices

* From the monthly letter of the Anthracite Coal Operators' Association.

or rooms. Then steam heating plants replaced the single furnace, and to fire them a cheaper anthracite, chestnut or pea coal, was used. Now the central steam heating plants, equipped with all labor saving appliances, are gradually taking the place of the local ones, and these large plants use the cheapest anthracite—buckwheat, rice and smaller—and their example has spread to the buildings which maintain their own steam plant. With such change there has been a reduction in the quantity of coal used and in the size. To heat an office building by steam, using stove coal, would require a smaller quantity than if stoves were in each room or a hot air furnace in the basement. There has been this decrease in consumption, and coupled with it the more serious change from the larger and profitable sizes to the smallest, and a further reduction in the quantity of these when bituminous coal is added to the fine anthracite. These central steam heating plants have been established in large and small cities and towns of fair size, and their patronage is growing steadily. Where the city ordinances do not prohibit smoke, it is to be expected that they will use soft coal when it can be purchased for less than anthracite, and with improvements in furnaces and grates tending to prevent smoke cheap bituminous coal may be used in all places.

ELECTRICITY.

As to possible competition from electricity as a heating agent, this is still for the future to develop. As yet it is too expensive and uncertain, but when there is considered the enormous advance which has been made in the past ten years in its application to various purposes, it cannot but be felt that the future, and maybe not far distant, may bring about inventions which will have overcome the present obstacles and place this convenient agent on a basis where it can compete, on most favorable terms for itself, for the household position now claimed for anthracite.

Indeed, viewing the anthracite situation from a broad standpoint, it must be admitted that the conditions of to-day are as radically different from those ten years ago as at that time conditions differed from 1877. The change in the industrial situation has been gradually crystallizing into the one idea of centralization. This in manufactories means large establishments with a central steam plant. Such an establishment can afford to construct this plant so as to contain all of the latest and best improvements tending to increase its efficiency, and can experiment in this direction where smaller manufactories cannot, because of the cost. The prime object of any modern steam plant or manufacturing establishment of any kind is, quality being satisfactory, to produce the largest possible quantity at the lowest possible cost. Consequently, in the matter of fuel, the cost per unit of work done is the basis of comparison. Since it is a practical and admitted fact that anthracite prepared sizes, chestnut and larger, do not possess any intrinsic heating merit over a good quality of soft coal save in being smokeless, and since the latter coal sells for less than half the price for anthracite, then these sizes of anthracite are virtually out of any competition with bituminous coal. The small sizes of anthracite, however, sell at nearer the price of soft coal and are about equal to it in heat value, and these two are active competitors, and soft coal has a growing opportunity through its lower cost and the improvements by which it may be burned without smoke.

Considering the facts that have been given, and also the statistical position of the anthracite trade, it is evident that the entire tendency of to-day, while not yet toward a decreased consumption of anthracite per capita, is toward a marked increase in the consumption of the small sizes in preference to the prepared sizes, and in this connection there is good reason to believe that there has been an actual decrease in the per capita consumption of the latter sizes. Where will be the end? It is impossible to produce these small sizes and sell them at their present prices with profit, and if the price is increased above that of soft coal the latter will largely replace the anthracite.

It is not intended to go to the other extreme and become unreasonably pessimistic as to the future for anthracite. There is the certainty that this coal will be used by many for long years to come, but it is poor policy to disregard self evident dangers and stand idly waiting for the time when they will assume such proportions as to require a drastic remedy, with the chance that it may be applied too late.

Where Aluminum is Unsuitable.

Aluminum has been suggested for many purposes for which it is not adapted, said President Alfred E. Hunt of the Pittsburgh Reduction Company, in the course of a recent lecture before the Franklin Institute of Philadelphia. Prominent among these may be mentioned cases where much soldering or brazing of the metal has to be done. Because of the difficulties in soldering and brazing the use of aluminum has, in most such cases, failed.

Another source of failure of the metal has been in attempts to apply it where gas or liquids are confined under heavy pressure in aluminum apparatus. Aluminum has so far proved so open and porous in its texture as to be incapable of withstanding, in the form of castings, more than 100 pounds per square inch without leaking. Undoubtedly, in the future, better work will be accomplished and aluminum castings will be made which will withstand higher pressures without suffering liquids or gases to percolate through the pores of the metal; but, so far as the writer is aware, this has not been found to be the case in commercial work of pure aluminum and alloy castings of the present day.

Another source of failure of aluminum in the arts has been the attempt to use it under high temperatures. The melting point of aluminum, according to the latest experiments, is 1200 degrees F. The "critical point," if I may be allowed to use this term in this connection—that is, the place where the metal begins markedly to lose tensile strength—is lower comparatively for aluminum than for metals of higher melting points. While it is true that copper, steel and similar metals all markedly lose in strength when heated to over 500 degrees F., with aluminum the temperature at which the metal begins to lose materially in tensile strength is between 300 and 400 degrees; and the writer would not recommend the use of aluminum where the temperature is in excess of 300 degrees F. This will preclude the attempts which have been made to use aluminum for steam boilers and steam apparatus of similar character where the pressure is high. It has been found that a small percentage of iron materially raises the melting point.

Iron Meteorites.

The enormous iron meteorite—so called—which was recently brought to New York by Lieutenant Peary from Greenland has excited a good deal of public interest in these comparatively rare objects. Its weight is said to be nearly 100 tons, or exceeding that of any specimen of a meteorite hitherto located. A few of the largest iron meteorites that are known are mentioned by a writer in the New York *Tribune* as follows: One which was found near Cranbourne, Australia, weighs 8224 pounds, or about 4 tons. An irregular mass found in the interior of Brazil, near the Bendego River, more than a century ago, and recently removed to the National Museum in Rio Janeiro, has been estimated at 7 tons or more. South America also has another huge specimen. At Tucuman, in the Argentine, there is a 15-ton block. The Gregorio meteorite, found in Mexico, weighs about 18 tons, and is the largest single block whose genuineness is undisputed. The Chupaderos specimens, now belonging to the School of Mines in Mexico, weigh 10 and 12 tons respectively, but are parts of what was once a single mass. The two finest collections of meteorites are those in the British Museum and in Vienna.

N. E. Whitaker, president of the Whitaker Iron Company, Wheeling, W. Va., has accepted the West Virginia vice-presidency of the National Association of Manufacturers of the United States.

A large shipment, consisting of 24 cars, of enameled steel tanks was made last week by the Pfaudler Vacuum Fermentation Company, Detroit, Mich., to Boston. The tanks are said to be the largest specimens of enameled steel ware ever made.

The main offices of the Pittsburgh Reduction Company, manufacturers of pure aluminum, have been removed from Pittsburgh to New Kensington, Pa., where the works of the concern are located. In the future all mail should be addressed to the company at Pittsburgh, as heretofore, while all telegrams and other communications requiring immediate attention should be sent to the company at New Kensington, Pa.

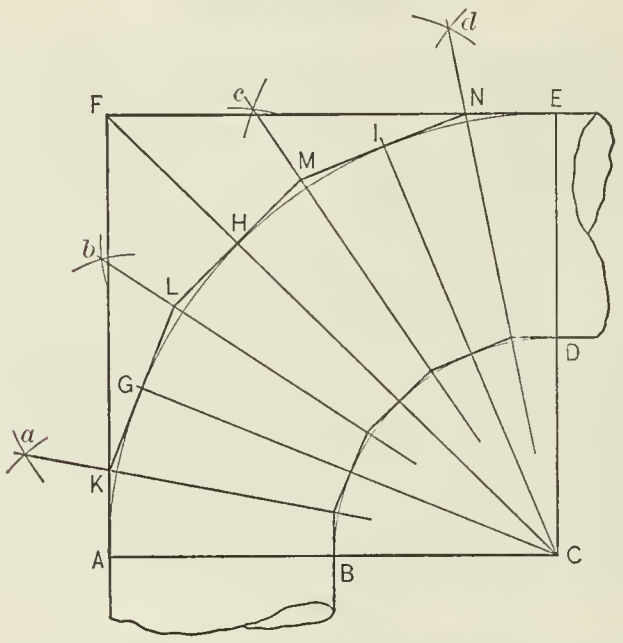
SHEET METAL WORK.

ELBOWS OF MANY PIECES AT ANY ANGLE.

A correspondent, "J. P. J.," Manitoba, asks us to present in the columns of *The Metal Worker* a method of obtaining the pattern for an elbow in any number of pieces at any angle.

What our correspondent probably wishes to know is how to draw the elevation of any elbow embraced within the scope of the above inquiry rather than the method of developing the pattern. With a correct elevation or draft of the required elbow, showing the exact number and angle of the miter lines, any one familiar with elbows in general would have no trouble in cutting the patterns.

Let it be required to draw the elevation of a right angle elbow in five pieces. Upon any horizontal line, as A C in Fig. 1, set off the required diameter of the elbow A B. Upon A B extended assume any point, as C, which may be placed nearer to or further from B according to the space allowed for the curve of the elbow. From C as a center, with C A as radius, describe the arc A E, terminating it with a vertical line from C. Now divide the arc A E into a number of spaces equal to one less than the required number of pieces in the elbow. As a five-piece elbow is required, divide A E into four equal spaces, as shown by the points G, H and I, and from each of the points of division draw lines to C, as shown. Then C A, C G, C H, C I and C E will be the five center lines of the five pieces as required. The miter lines may then be found by bisecting the angles A C G, G C H, &c., either as shown by the intersections of the arcs at *a*, *b*, *c* and *d*, or by drawing the lines through the points G, H, I and



Elbows of Many Pieces at Any Angle —Fig. 1.—Right Angle Elbow in Five Pieces.

E, respectively at right angles to G C, H C, I C and E C, intersecting at the points K, L, M and N, from which points the miter lines are drawn to the point C. The inner line of the elbow or throat may be completed by drawing the side of each piece parallel to the outer sides and tangent to the arc B D, whose center is C.

In speaking of the five center lines referred to above, it will be noticed that the lines C A and C E, though not center lines in the true sense of the word, occupy the same relative positions to the adjacent miter line as do the center lines of the three intermediate pieces. A five-piece elbow therefore consists of three symmetrical pieces and two half pieces, extended according to convenience, to form part of the lines of pipe. Since between any five radial lines only four spaces can exist, and since the center lines of the several pieces of the elbow are obtained first, the reason for dividing the arc of the elbow into one less space than the number of pieces required is obvious.

Should it be required to construct the elevation of an elbow at other than a right angle and of the same number

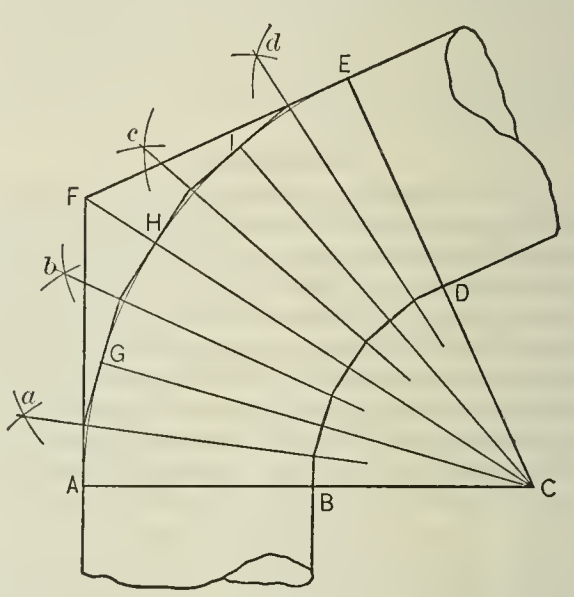


Fig. 2.—Five-Piece Elbow of Other than Right Angle.

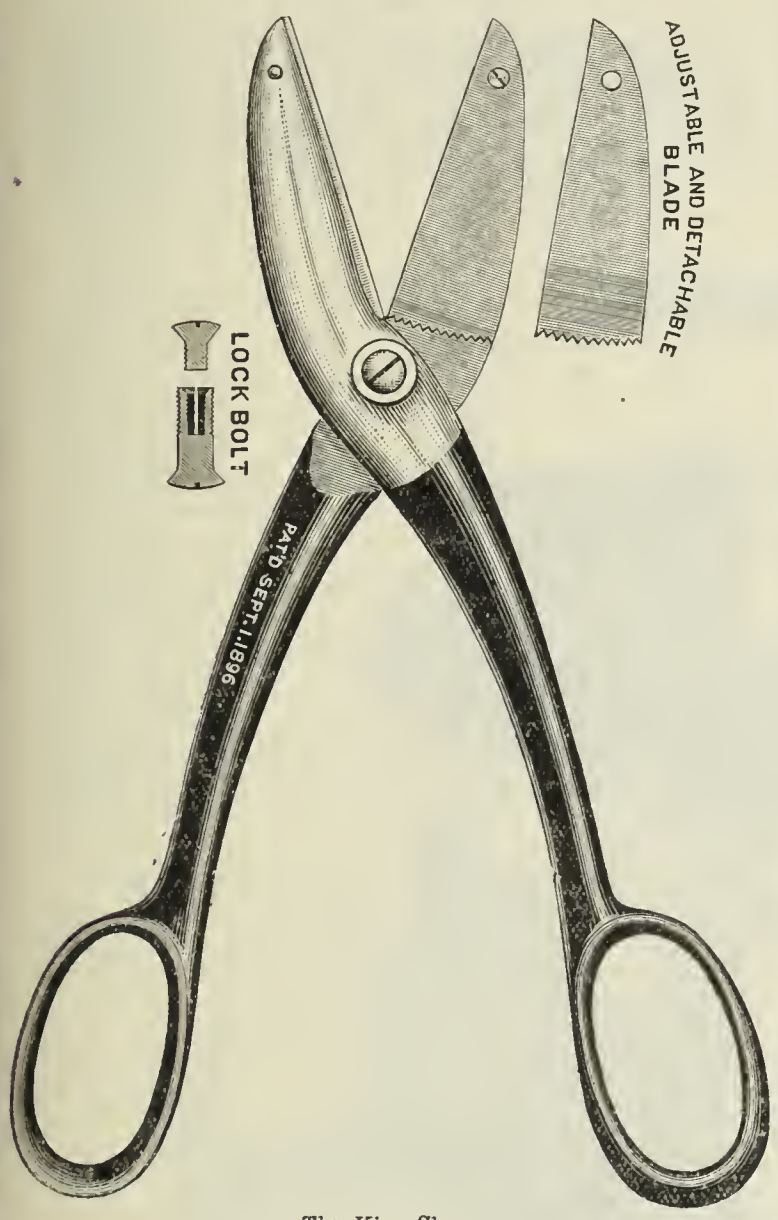
of pieces as before, the work can be accomplished by exactly the same method as given above for the right angle elbow. In Fig. 2 let A F E be the required angle. First bisect the angle A F E by the line F C, and upon F C establish the point C at convenience, as before. From C draw C A and C E, respectively at right angles to A F and F E, and from C as a center, with a radius C A or C E, draw the arc A E. Divide the arc A E and conduct the subsequent operations all as described above for the right angle elbow. The reference letters in Figs. 1 and 2 are made to correspond, so that the demonstration applies equally well to either figure.

Export Business in Galvanized Iron.

According to a prominent export firm interested in the Mexican trade, the galvanized sheet iron manufacturers of the United States are losing considerable business in Mexico on account of not being able to compete with the British makers. "Recently," said a member of this firm to a representative of the New York *Journal of Commerce*, "we had occasion to purchase several tons of this material. After obtaining prices from all the Eastern and Western manufacturers that we knew of, we cabled for prices to London. The British quotations were about 10 per cent. lower than the lowest American price. It is only in emergency cases that galvanized sheets can be purchased in this market for export. If the exporter can afford to wait money may be saved by sending for it to the other side, shipments to be made direct." A leading firm in the Argentine Republic trade claim, however, that recently they have found that the American sheet iron manufacturers have begun to realize that the South American market is quite important, from the number of orders they have lost, and it is believed every effort is being made by several of the most prominent manufacturers to increase their trade. The increased use of galvanized iron sheets for building purposes both in Mexico and Argentina has led to an important trade in this article. Great Britain, according to official figures, sold Mexico in the first eight months of this year 2893 tons, worth $158,490, as against 2598 tons, worth $148,395, in the same period last year.

The King Shears.

We illustrate herewith the King shears, manufactured by the Hagey Stove Company, St. Louis, Mo. A special feature of this tool, as the illustration shows, is the adjustable and detachable blades, which are made of tool steel, carefully tempered. These blades are fastened at the point by means of a lock bolt, the ends being counter sunk even with the face of the shears, so there are no nuts to come loose or interfere with the cutting. The inner end of the adjustable blade is serrated and is fastened in place as shown in the illustration. The manufacturers state that the shears will last a lifetime with an occasional set of new blades. They also point out an advantage on their shears, due to the fact that the blades are not subjected to the great heat of welding. The King shear blades can be taken off the shear and ground, it is claimed,



The King Shears.

in one-quarter the time required for a welded blade shear, and by the notches in the ends of blades they can be set to corresponding notches in the shears. The blades can be adjusted and ground until used up, when a new set of blades can be obtained at a small cost. These shears are made in six sizes with from 2 to 3½ inch cut.

FLASHINGS.

A circular printed in blue and red is distributed by the Double Truss Cornice Brake Company, Buffalo, N. Y., in the interests of their brake, with which many of our readers are familiar. The circular numbers a dozen pages and contains testimouial letters, all of which are dated September of this year, and come from the East and the West and the North and the South. The satisfaction which the writers express is excellent testimony to the qualities of the Double Truss Cornice Brake. On the last page is a list of a number of large buildings for the Cornice and Sheet Metal work of which these Brakes were used.

The roofing establishment of J. F. Young of Thirty fourth street, Pittsburgh, Pa., was visited by fire last week, and through the destruction of the building and machinery a loss of $7000 was sustained.

The Scottdale Iron & Steel Company, Scottdale, Pa., have dismantled their Bar and Muck mills and will install in their room a new train of three Sheet mills. Five new furnaces will also be added and other improvements will be made in the company's plant.

The four sheet mills of the Sharon Iron Company, Sharon, Pa., have been put in operation.

A fine specimen of what can be done in architectural sheet metal work is shown in the new front on the building of P. McGovern, the work having beeu done by F. W. Stelling, Hartford, Conn.

The Geo. Drouve Company, Bridgeport, Conn., are making the skylights for the new *Times* Building, at Hartford, Conn.

The Board of Trustees of the North Illinois Insane Asylum, Elgin, Ill., recently placed an order for about 100 squares of Smeeton's metal shingle, manufactured by Henry Smeeton, 109 Main street, Ottawa, Ill. Some eight years ago the trustees of the asylum made a test of various roofings and decided in favor of the Smeeton shingle, they now having some 500 squares of this roofing on the building. The shingle has double locks on each side of its four sides, a feature to which the manufacturer particularly alludes.

Proposed Machinery Museum in China.

Gervase Cooke of the Anglo-Chinese College, Foochow, China, writes with reference to the establishment of a museum for the display of European machinery. He says: It is because of the conditions of Chinese mechanical appliances that I have decided to open a museum of all kinds of machinery, in order that the Chinese may understand by comparison the clumsiness of their tools. Foochow has a population of over 1,000,000 and is the capital of Fukien province, one of the largest literary and political centers of the empire. The leading men of the province are alive to modern improvements, and plans are being made to introduce such machinery as will be helpful to the Chinese. By invitation I came to China to start flour, rice and cotton mills, and assist in introducing modern machinery and open up mines. In conversation with Li Ye Chen, Chinese ambassador at Calcutta, India, he expressed himself greatly pleased to learn that steps were being taken to introduce modern machinery into China. I have already been engaged by a Chinese syndicate as consulting, civil and mining engineer, to open up coal, silver, lead and iron mines and to erect furnaces for smelting the metals in the province. Mauy specimens of the minerals have been examined and found to be very valuable. The coal is anthracite and of a splendid quality. Already some tools and appliances have been ordered for the purpose of developing the mines. The museum referred to is to be conducted solely for the purpose of increasing the interest and knowledge of Western learning and attracting the attention of inquirers. Exhibits of the character above described will be received and advantageously employed for the benefit of exhibitors as circumstances will permit. Working models, photographs or drawings of machinery and inventions or specimens thereof may also be sent. Each exhibit which may be presented to the museum will be marked in Chinese, with the name and address of the maker, together with the description, price (if desired), and a capable translator will explain their use to inquirers.

The Chamber of Commerce of Cologne, Germany, recently sent a circular letter to a number of firms in the vicinity of that city who are engaged in trade with the United States, asking their views as to the adoption of retaliatory duties by Germany to meet the new American tariff law. The *Cologne Gazette* reports that a large majority of the export firms and of the importers declared themselves strongly against such a course.

On her Easteru passage between New York and Southampton, the "Kaiser Wilhelm der Grosse," the huge new North German Lloyd steamship, again broke the Atlantic record, makiug the passage in 5 days 15 hours 13 minutes, reducing her own maiden time, accomplished in the previous week, by 7 hours 22 minutes. The best eastward record on the same course was, until last week, held by the Hamburg-American liner, "Fuerst Bismarck"—namely, 6 days 10 hours 32 minutes. The new vessel has reduced this by 15 hours 19 minutes.

A dispatch from Houghtou, Mich., says that the St. Mary's Canal & Mineral Land Company bave sold a tract of 4000 acres of mineral land, locally known as the Six-Mile Hill Mine, to Cameron, Currie & Co. of Detroit, for $500,000. A company is being organized in New York to operate the mine, which is said to have au excellent quality of copper.

Francis I. Maule, the well-known advertising specialist, has returned from Europe. Mr. Maule's address is 328 Chestnut street, Philadelphia.

HEATING AND PLUMBING.

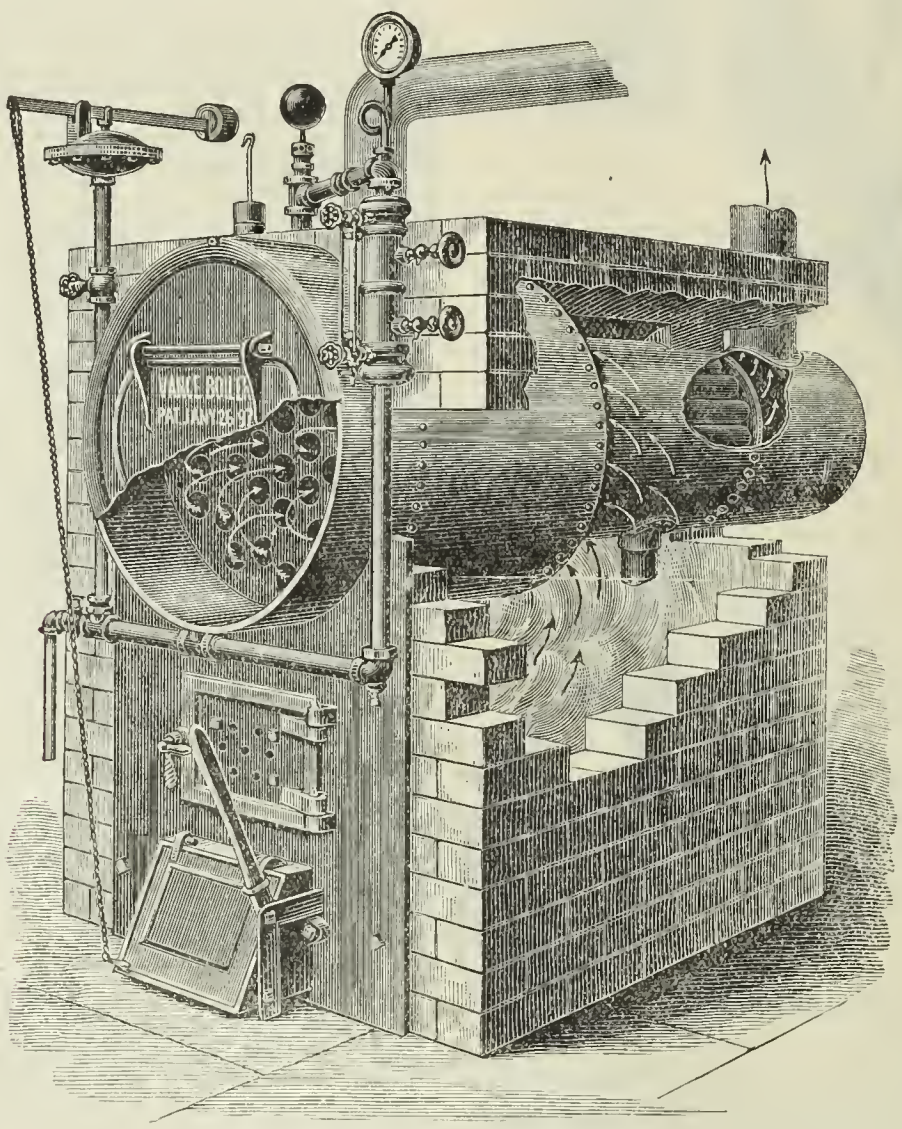
The Pennsylvania Steam Fitters' Convention.

William P. Thompson, National vice-president for Pennsylvania of the National Association of Master Steam and Hot Water Fitters, has issued from his office, 112 Bread street, Philadelphia, a call for a convention of the Pennsylvania Master Fitters, in accordance with the proposal to hold a convention last June, and which was delayed. The convention will be held at the Hanover Hotel, at Twelfth and Arch streets, Philadelphia, at 2 p.m., on Wednesday, October 27. National President E. D. Smith will preside at the convention, and will lend his assistance in the work before it. All who are engaged in the heating trade throughout the State, whether members of the association or not, are invited to be present to acquaint themselves with the objects of the association and to become members. It will be an open convention to gather the craft and legislate for the mutual benefit of the trade.

C. T. Stephens has formed a partnership with Fred. Masters to conduct a plumbing and steam fitting business at Ithaca, N. Y. The present plumbing inspector, Mr. Chappell, was formerly in the employ of Mr. Stephens, and the department left vacant by his withdrawal is supplied by the forming of the partnership. Mr. Masters has been engaged in the plumbing trade for the past 20 years and is considered one of the most expert plumbers in the city. The plumbing shop of the new firm is situated in the basement of Mr. Stephens' store, corner of State and Aurora streets. The new partnership applies only to the plumbing department, and does not include the hardware business, which will be continued by Mr. Stephens the same as in the past.

The Vance Boiler.

A house heating apparatus of somewhat different type from that generally used for the purpose is presented in the Vance boiler, shown herewith by means of a broken view. The boiler, which is made by the Vance Boiler Works, Geneva, N. Y., is arranged for brick setting and has a rectangular fire chamber fitted with a labor saving grate. The boiler proper is formed of two cylinders, supported horizontally over the fire, the larger one at the front presenting the larger exposure to the fire, and is connected with a smaller cylinder at the rear. The products of combustion on rising from the fire pass through the tubes in the lower portion of the boiler to the front and return through the tubes in the upper part of the boiler to the rear and finally to the outlet, the shell of the smaller cylinder at the rear being continually exposed both to the fire and the gases in active course of combustion, so that the boiler presents what is said to be a very efficient heating surface, and it is claimed that the arrangement is such as to secure a large saving in the fuel consumption. A plate is arranged at the front of the boiler, through which the tubes may be readily cleaned with a brush. The boilers are made in 13 different sizes, and equally well adapted for either steam or hot water heating. For steam heating they are rated to carry from 150 to 2500 square feet of surface, and from 350 to 3800 square feet of surface for hot water heating. The catalogue of the company gives grate and fire surface of the boiler, and the propor-



The Vance Boiler.

tion in the steam boilers is 1 square foot of grate surface to about 30 square feet of fire surface, and the proportion of fire surface to radiating surface increases as the boilers increase in size from 1 to 5 in the smaller sizes to 1 to 8 in the large sizes. In hot water heating the proportion of grate to fire surface is 1 to 25, and the proportion of fire to radiating surface is 1 to 10. A catalogue which gives full details and description, with prices and dimensions, can be secured on application.

The Journeymen Plumbers.

The National Association of Journeymen Plumbers, Steam Fitters and Steam Fitters' Helpers closed their annual convention at Nashville, Tenn., by electing the following officers :

President, John S. Kelly of Chicago.

Vice-Presidents, W. F. Hagerty of Nashville, J. L. Richardson of Cincinnati, L. H. Balfe, Denver, Col.; William Marsh, Washington, D C.; Joseph Burger, St. Louis ; L. H. Tilden, Cleveland ; C. F. Cromer of Salt Lake City.

Secretary and Treasurer, W. J. Spencer, Buffalo, N. Y.

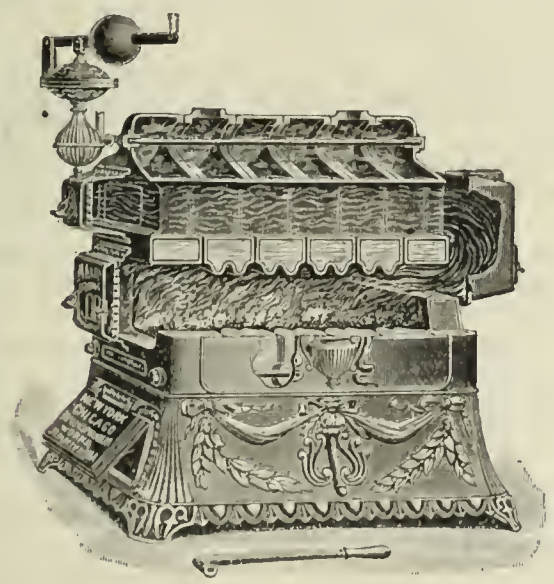
Assistant Secretary and Treasurer, J. D. Meeks, Pittsburgh, Pa.

The next convention will be held in Cleveland, Ohio, in September, 1898. M. J. Counihan, who has been secretary for a number of years, refused re-election, although the popular choice, as he did not care to take up his residence in Chicago, preferring to remain in his native city, Pittsburgh.

President Kelly and Secretary Spencer are arranging for several conferences provided for at the convention. One of these will be with the Master Plumbers' National Association, and is for the purpose of making a new apprenticeship law on the lines in force in Chicago—one apprentice to each shop. Another will be held with the officials of the Steam Fitters' International Union, and contemplates the uniting of the two organizations. At the last meeting in December every branch of the United Association will vote on a proposition to adopt the system of strike, sick and out of work benefits on the plan in force in the Cigarmakers' Union.

The Bundy La Villa Heaters.

The sectional view, Fig. 1, presented herewith, shows the construction of the Bundy La Villa heater, made by the A. A. Griffing Iron Company, 66-68 Centre street,



The Bundy La Villa Heaters.—Fig. 1.—Sectional View.

New York City, with works at Jersey City, N. J. The manufacturers refer to the fact that it is ornamented and thus designed for placing in a living room, which can be warmed by the heater the same as if a stove warmed it. This arrangement is necessary where there is no cellar under the house, and is the condition also met with in many small railway stations, which can be heated by placing the La Villa heater in one waiting room and radiators in the other room and in the ticket office. The heater is made in two styles, one ornamented and the other plainer, the latter costing less and being the one adopted where the heater is to be set in the cellar or in a vacant room. Where it is placed in an inhabited apartment it may be supplied with an ash pan, the same as a stove.

The products of combustion travel three times the length of the heater, and the fire box is corrugated at the top and sides to secure the greatest amount of fire surface. The heater is cleaned by opening the front and rear clean out doors, and the manufacturers particularly allude to the ease with which the cleaning can be done, and emphasize the necessity of keeping the surfaces clean if the heater is to give economical and efficient results. The La Villa is not designed for heating large buildings, its legitimate field for use ranging for steam in the smallest houses to those requiring 700 feet of radiation and for hot water up to 1050 square feet of radiation.

The heater is provided with a dumping and rocking grate of an improved herring bone pattern, a broken view of the base being shown in Fig. 2. The fingers interlock and the space between is uniform throughout, as is also the space between the grate and sides and ends of the fire pot. The bars rest on supports that are securely fastened to the sides of the ash pit. Special care, the manufacturers state, has been taken to secure a liberal area in the air supply through the grate, without having any openings large enough for unconsumed coals to drop

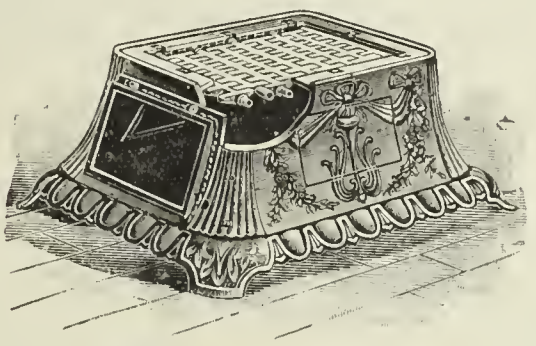


Fig. 2.—General View of Grate.

through. The grates are all in position when the heater is shipped, but they may be removed and replaced at any time through the opening in the side of the ash pit by removing the panel shown in Fig. 2.

Plumbing Class at Bridgeport.

The course of instruction in plumbing at the Trade School and Institute at Bridgeport, Conn., under the supervision of C. S. Eames, is as follows: The instruction will be both manual and scientific. The manual instruction will be as follows: 1, Lead seams; 2, overcast joints; 3, cup joints; 4, calking; 5, wiping horizontal round joint; 6, horizontal branch joint; 7, upright round joint; 8, quarter bend; 9 upright branch joint; 10, wiping on a stop cock; 11, wiping a flange on a 2-inch pipe; 12, wiping a 2-inch ferrule; 13, wiping in a bath plug; 14, wiping a vertical branch; 15, wiping a side flange; 16, traps. At the conclusion of this course, miscellaneous and fancy work—wiping tank seams, setting basins, boiler work, sand bends, &c.

The scientific instruction will be upon the proper arrangement of service and waste pipes and upon drainage and ventilation, as follows: 1, Drain, soil and waste pipes; 2, supply pipes; 3, boilers; 4, tanks; 5, fixtures; 6, trapping and ventilation of fixtures; 7, pump; 8, miscellaneous.

Water Main a Century Old.

A curious wooden water main and a brick sewer have been unearthed in Centre street, New York, by workmen employed in laying the new trolley system of the Metropolitan Street Railway Company. The sewer was made of brick, with walls 6 inches thick, and was 8 feet in diameter. When it was broken open several bricks bearing the imprint "Manhattan, 1797," were found. All the bricks were peculiar in shape, being only 1½ inches thick. It was near Canal street, in Centre, that 100 feet of the wooden water main was found. The main was made of logs, about a foot square, and made hollow by burning. Each section was about 5 feet long, with one end sharpened like a lead pencil so as to fit into the next length. Each joint was fastened with a riveted iron band. Both the sewer and the water main were laid by the Manhattan Company, who received their charter from the Legislature and were established in 1799.

The New York Central Iron Works, Geneva, N. Y., recently made a shipment of 20 of their Dunning steam heating boilers to Philadelphia, and a shipment of 20 more to a New England house. The works are now running overtime.

A Warm Discussion.

A little pamphlet in a lemon colored cover bearing a design in red and black is entitled "A Warm Discussion," and relates to the Gorton side feed boilers. These boilers are of wrought iron construction, with drop tubes, so that a large surface is presented, the tables in the book giving the amount of surface exposed in each boiler. The principal feature which is dwelt upon in the pamphlet is the provision for supplying the fuel, openings being made at the top of the fire pot at four different points. The opening slopes at the bottom so that the fuel is fed in by gravity, in much the same manner as fuel is supplied to the fire by a mechanical stoker. This arrangement, it is pointed out, serves an excellent purpose when soft coal is used. Another feature which adds to the advantage of the boiler for soft coal is the construction of the grate and a fingered ring placed above the grate and below the bottom of the fire chamber proper. With this fingered ring an abundance of air may enter the fire, and effect such thorough combustion that heavy smoke is prevented. It is claimed that by this construction of grate and fire chamber the smoke issuing from the chimney to which one of their heaters is attached is of the same general appearance as that issuing from the chimney where hard coal is used, so that not only is fuel saved in developing a given heating power but also the soot nuisance in the atmosphere removed. Accompanying the pamphlet is a sheet of testimonials from the soft coal regions of Ohio and Iowa, in which the owners claim that with the fine refuse or slag coal, which can be purchased at a small cost, the heaters operate satisfactorily.

The Trade in Brass Fittings.

As there is no other line of business which better illustrates the general progress in the iron manufactures than that of the manufacture of brass fittings, a short review of the business for the past year in this line will be of interest to readers of *The Iron Age*, says a Cincinnati correspondent of that journal. One of the largest and most prosperous brass working establishments in this section of the country is the Lunkenheimer Company, whose headquarters are in this city, with branches in New York and London. Secretary D. T. Williams of the company thus outlines the situation: Business was better in 1896 with this company than it was in the year preceding, and so far 1897 has been much in advance in volume of the business done in the same period in 1896. During all the hard times which are now believed to be drawing to a close this concern have gone on steadily expanding, taking in new quarters, putting more men to work and otherwise increasing facilities for turning out work. At this date they have just rented the building on Eighth street immediately east of their factory and are now moving their office and salesrooms into it, thus giving more room for the manufacturing part of their business in the old building. Secretary Williams attributes the unchecked success of this company to judicious advertising, backed of course by superior quality of goods turned out. All through these years, while other concerns were bewailing the hard times and cutting down the expenses, decreasing advertising, &c., the Lunkenheimer Company were more aggressive than ever in keeping themselves before the public notice, and the result has been as stated. Secretary Williams says that they understand perfectly well that their business on that account is not a good criterion of trade in general. The concern furnish steam fittings and engine builders' supplies. The demand in this line shows that there is considerable expansion in that branch of manufacture. The agricultural implement manufacturers have also been taking considerable of their product during the past six months. About 25 per cent. of the entire product of their factory during the year 1896 went to foreign countries. At the present time the outlook is much better. There is a brighter and stronger feeling in jobbing circles, and everything goes to show that stocks are being largely increased. Business is well distributed over all sections of this country. Prices have remained practically unchanged, and there appears to be no immediate prospect of an advance which would be commensurate with the increased cost of metal. When asked the pointed question as to whether prosperity was really upon us or whether the good time talk was simply a myth, Secretary Williams expressed himself in unqualified terms that not only was the outlook better but that actual business on all hands was being much increased.

Another large and exceedingly prosperous concern are the William Powell Company. Secretary Albert thus outlined the situation: The early quarter of the year 1897 was a rather quiet one; the second quarter trade showed some improvement; the last three months it has been very good, and at the present time the large shops are running on full time with a full complement of labor. The year so far, on the whole, shows but little improvement excepting the last quarter over last year, but from the present outlook it is believed that by January 1, 1898, they will have a nice surplus over the amount of business which was done last year. Prices are still rather low. Metals have advanced. Two years ago the concern bought copper at 9½ cents a pound; now they have to pay 11¼ cents, but as yet the general condition and the sharp competition prohibit advancing prices. The general outlook is excellent, and Secretary Albert expresses the positive opinion that an era of good times has dawned upon the public generally. The company's trade is pretty well distributed over the country, and there has been and is now no special movement in any branch sufficient to attract their attention. The company make no special effort to secure foreign trade, yet at the same time they find their sales in that direction gradually expanding, and it is a question if in the near future they will not have to pay more special attention to that trade than they ever have done in the past.

Alexander Riegler, an old time manufacturer of this city, who makes a specialty of water works and plumbing goods, whose trade-mark is well-known all over the United States, reports business at his shop to be about as follows: He has always enjoyed a very large local trade, and while this has been a little light for the past year or two, yet at the present time it is showing considerable increase, and the prospect of the erection of new water works in this city gives him reason to believe that his local trade will soon resume its former proportions. Within the last few months quite a good sized proportion of the product of his shops has gone to Southern cities, where he has had some pretty good municipal contracts. Thus far 1897, however, has been but little if any ahead of 1896 in volume of business, and prices are still exceedingly low, competition sharper than it ever was and metal advancing. At present all signs, however, point to an immediate expansion of trade.

NOTES.

J. B. Colt & Co., 115 Nassau street, New York City, who are the sole agents for the Automatic Acetylene Gas Generator, are exhibiting in the New Zealand Building, Thirty-seventh street and Broadway, New York City, a complete acetylene gas generating apparatus in operation, and other apparatus showing the uses to which the acetylene gas may be put for lighting magic lanterns and other purposes.

James J. Duggan, Baltimore, Md., bid $2900 and secured the contract for a flushing closet system for No. 30 Primary School and No. 8 Grammar School.

The Judson A. Goodrich Company have been incorporated in New York to manufacture Steam and Hot Water Heating Apparatus and Supplies, with a capital of $10,000. The directors are Judson A. Goodrich, R. Ward Hillman and Charles L. Krefel. The new company have their office at 228 Water street, New York, and are already known to the trade, having been engaged in business some time under the name of Judson A. Goodrich & Co.

The Enterprise Gas & Electric Fixture & Brass Company of St. Louis have been incorporated, with a capital of $20,000, by Fredelshon Harris, T. A. Morrey, Eulalia H. Morrey and Harry Phillips.

The Commissioner of the Building Department of Boston, John Damrell, has appointed the following men as inspectors of gas fitting, in accordance with the law which went into effect October 1: Charles B. Gould, Charles E. Phillips, Ernest Blasser, James W. Flynn, Luke J. Hakey, David A. Finnegan, Joseph L Curren and Charles A. Hawes.

George Randell, a licensed plumber of Reading, Mass., and an inspector in the State, has opened a shop in the Wallace Block on South street, Milford, N. H.

A. J. Sampson has been granted a license as a plumber at Bangor, Maine.

The Mayor of Hoboken, N. J., will receive bids until October 27 for a hot water heating system for Fire Engine House No. 4.

R. T. Salyers of Middleboro, Ky., is engaged in a number of roofing and plumbing contracts at Cumberland. His contracts include two new buildings and a brick block.

F. W. Larney, Vancouver, B. C., has succeeded to the plumbing business of McCarthy & Larney. Mr. Larney has just finished a job in Masonic Hall of that town which is said to reflect credit on his skill.

George Drought has opened a plumbing, steam and gas fitting establishment on Butler street, Port Huron, Mich.

A Hartford, Conn., paper gives a list of a large number of plumbing, heating and gas fitting contracts which have been awarded to James Ahearn of that city, with the explanation that his success is due to the fact that he understands his business in all its branches, is progressive and never fails to give satisfaction to his customers. Some of the more prominent buildings in which Mr. Ahearn is doing work are St. Patrick's School, St. Francis' Hospital, Hart-

ford Public School, Brown's School Annex, St. Joseph's School, mechanical department of the Hartford *Times*, Travelers' Insurance Company Building, New Britain High School and a large number of private residences in some of which he is installing an electric lighting plant.

The half yearly meeting of the National Association of Master Plumbers of England will be held at Bradford on November 10. The English association is planned largely on the lines of the National Association of Master Plumbers of the United States, and is looked upon with high favor by the trade.

The Supervising Architect, Washington, D. C., will receive bids until October 27 for a steam heating and ventilating system for the Post Office at Saginaw, Mich.

The George P. Steel Iron Company, manufacturers of Steam and Hot Water Heating Apparatus, 330 Philadelphia Bourse, Philadelphia, Pa., have been succeeded by the George P. Steel Company, who continue the same line of business.

In the Circuit Court sitting at Huntington, Ind., Judge Watkins declared as unconstitutional the Huntington city ordinance providing that no one but residents of Huntington could obtain a plumber's license to do work in the city. The case came up on appeal from Mayor Cast's decision some weeks ago. The Mayor decided the same way, but upon the theory that a city council had no authority to pass such an ordinance. Robert Spice, a Fort Wayne plumber, secured the contract for plumbing the residence of the Rev. John R. Quinlan. He sent John O'Rourke to do the work and O'Rourke was arrested for working without first obtaining a license.

T. D. Barlow of the plumbing firm of Barlow Bros. Company, Waterbury, Conn., has been elected Mayor of that city.

Thomas F. Burns, Norwich, Conn., has just completed the installation of a hot water heating plant in Beach & Dudley's warehouse, Bridgeport.

The Hopson & Chapin Mfg. Company, New London, Conn., have been awarded the contract for the hot water heating in Col. A. C. Tyler's new residence.

The New England Engineering Company of Waterbury, Conn., have opened an office at 102 Orange street, New Haven, under the management of E. L. Stevens, who has represented the company in that section for some time past.

Sullivan & Wesley, plumbers, are building a four story block on High street, Holyoke, Mass.

Paul Bulow, a plumber who is known in Leavenworth, Kan., and Southern Illinois, opened a shop at Helena, Ark., about a year ago and reports that he has done a good business and has no report to make of hard times. He is now engaged on the plumbing and gas fitting for the St. John's P. E. Church.

The slot gas meters introduced a year ago by the gas company of Omaha, Neb., have proven as popular as the company could wish. In fact, the meters cost so much that the company are not eager to push them. Most are in restaurants, some in residences and a few in Ninth street resorts. A silver quarter buys about 200 feet of gas, and a provident consumer, when flush of money, can buy to the limit by putting in five quarters. Recently a consumer dropped in a 20-cent piece by mistake. The gas ran out, of course, and the company were notified the meter was out of order.

William Donnelly, who was appointed plumbing inspector of Ashtabula, Ohio, has opened a plumbing shop on Bridge street.

Rufe Brothers, manufacturers of the Rufe steam and hot water boiler, Doylestown, Pa., are installing a fine system of heating and ventilation of the indirect type in the residence of Hugh B. Eastburn.

Jaynes & Blagden, John and Pearl streets, New York City, are sending out a little circular devoted to the Eclipse and Perfection hydrants and street washers. They also make a specialty of a full line of supplies for steam and hot water fitters.

The New Britain Brass Company, New Britain, Conn., have filed a certificate of an increase in their capital stock from $10,000 to $25,000.

The Armleder Plumbing Company have been incorporated, with a capital stock of $15,000, at Cincinnati, Ohio, by J. A. Armleder, Josephine Armleder, Daniel McDonald, T. J. Mayer and H. S. Peck.

A local paper in commenting on the test made of the flushing water closet system installed by the Fuller-Warren Company, Boston, Mass., in the Highland school at Lowell, remarks that five bottles of peppermint, which has a pungent and far reaching odor, were poured into the drainage system, but not the slightest odor was perceptible anywhere in the building, to the great disappointment of some of the committee.

Blake & Williams, 364 West Broadway, New York City, bid $21,811 and secured the contract for furnishing the ventilating and heating apparatus for the new public school No. 63.

The plumbing establishment of T. Roth, Mitchell, S. D., was recently visited by a fire.

The Davis Company of Moline, Ill., bid $18,975 and received the contract for heating, plumbing and lighting the Illinois Western Hospital for the Insane at Watertown.

The Vance Boiler Works of Geneva, N. Y., recently shipped a large steam heating boiler for a large hotel at Butte, Mont., and two large boilers for a heating contract in Northern Ohio. They also show a testimonial letter in which the statement is made by the owner that by the use of the Vance boiler he has saved one-half of the former cost for fuel for heating his building.

The steam heating trade will be interested in a little catalogue issued by Augustus Eichhorn, Orange, N. J., relating to specialties in radiators, steam fittings and couplings. The first illustration shows a system of piping in which special forms of tees and elbows are used for connecting the radiators. Three other illustrations show different styles of radiators for steam and hot water heating, in which it is claimed their capacity can be adjusted to the requirements of the weather.

J. B. Colt & Co., 115 Nassau street, New York City, are issuing a 30-page pamphlet, entitled "Acetylene Gas: Its History and Utilization," which the plumber and others who are interested in furnishing plants for manufacturing gas for buildings which cannot be supplied from street mains of gas companies will find of interest. The pamphlet shows their acetylene gas generator, and incidentally the principle of its construction is described in the book. The book describes the materials employed and the construction of the apparatus so that the reader may readily judge for himself as to its adaptability for general use in isolated buildings.

The E. J. Nolan Plumbing Company, Cincinnati, Ohio, are sending out a circular letter announcing that E. J. Nolan of the former firm of Nolan & Armleder has connected himself with the company, and they are prepared to do all kinds of work in their line. Under Mr. Nolan's supervision the plumbing in the new City Hall, the Sisters of St. Francis Hospital and the Summerset, San Marco and Trevarren flats was done.

The Metal Worker enjoyed a call from P. H. Doyle of Ogdensburg, N. Y., Mr. Doyle being in the city visiting the manufacturers and jobbers dealing in plumbers', steam and gas fitters' supplies. Mr. Doyle does a large contracting business, and in addition carries a line of supplies and does a jobbing business with the local trade.

W. K. Pierce, president of the American Boiler Company, and C. C. Jenkins, treasurer of Pierce, Butler & Pierce Company, Syracuse, N. Y., were visitors at the New York office of the American Boiler Company this week.

The Doric Boiler in front of the New York office of the Gurney Heater Mfg. Company of Boston, Mass., is being treated to a new coat of carmine paint, the idea of the manager, I. G. James, being that this contributes only a feeble idea of the heat that his line of Boilers is capable of generating.

The George B. Cobb Company, 44 Centre street, New York, representatives of the Niagara Radiator Company, Buffalo, N. Y., inform us that the plant is now running overtime, and that Radiators of standard hights can be shipped promptly. They are displaying on their sample floor the Niagara Radiator and the Niagara Radiator with open end section and the Niagara Junior, all handsomely decorated in appropriate color bronzes. The Niagara Junior is also shown in curved form as used around a column in a wall for supporting a building.

Pierce & Cox of Boston, Mass., are opening a branch of their plumbing business in the O'Brien Building, on Beach street, Manchester, Mass.

The Thatcher Furnace Company, 240 Water street, New York, have just issued circulars of their newest production in the house heating Boiler line, which they call the Thatcher Safety Sectional Steam Boiler. It is made in five sizes for both steam and hot water heating, and rated to carry from 525 to 1200 feet of direct steam radiation and from 940 to 2150 square feet of direct hot water radiation. This construction presents a large fire surface and is of the horizontal return flue type.

W. M. Mackay, manager of the New York office of Hart & Crouse, Utica, N. Y., is installing for heating their office and warehouse, at 235 Water street, a heating system which will be of interest to those who have con-

tracts for heating apparatus which must be set on the same floor with the radiation. The job will be piped on the one-pipe system, and in appearance has a strong resemblance to a one-pipe steam job. A No. 37 Royal Hot Water Boiler is used in connection with it.

S. L. Beidler of Mount Pulaski, Ill., has placed a number of Acetylene Gas Generators and lighting systems in the buildings of farmers in his vicinity.

The Sportsman's Shot Works, Cincinnati, Ohio, are sending to the trade an attractive postal card giving the lastest quotations on Pipe and Sheet Lead. The cuts show their By-Metallic Traps in various styles, Lead Pipe in coils as prepared for shipment, and Sheet Lead as crated by them for transportation. The prices quoted evidently will be of interest to the plumbing trade and can be secured on application.

At a recent meeting of the manufacturers of Copper Bathtubs in New York a strong disposition was shown to advance the price of Bathtubs in accordance with the upward tendency of copper.

A special number of the Los Angeles *Times* gives a long and interesting account of the Fortuna Mines, operated by a company of which C. B. Boynton of the Boynton Furnace Company is president. The account also states that Colonel Boynton is largely interested in coffee plantations in Mexico. The Colonel, in all probability, will be pleased to learn that he is a capitalist of wide and successful interest at home and abroad. This disclosure of the Colonel's interest in gold mining may be an explanation of his activity in the Sound Money campaign of last fall.

Since the State of Minnesota has been examining the master and journeymen plumbers in the State, it has developed that in Minneapolis and St. Paul the larger hotels employ an engineer who does more or less plumbing work in the building, and the Master Plumbers' Association are pointing out that this is not in accordance with the laws.

The master plumbers of Bridgeport, Conn., recently held a meeting at the office of L. H. Mills. Among the subjects discussed was the annual banquet, which has become quite a popular feature of the association.

The Begent, Lynch & Swayze Company have been organized at Hartford, Conn., with a capital stock of $16,000, to do a general plumbing business, and the stockholders are H. L. Swayze, L. S. Begent and Albert Lynch, Mr. Swayze having a one-half interest in the company, the remaining half being divided equally between the other two stockholders.

W. O. Garrison of the Standard Radiator Company, St. Louis, Mo., visited John I. Leitch, manager of their New York office, at 208 Centre street, this week, and in company with him visited a number of the prominent representatives of the heating trade in the city.

E. J. Jenkins & Co., Portsmouth, Ohio, inform us that they have closed a contract to install a heating apparatus in the City Hall and the Fire Department Buildings at Jackson, Ohio, using heating apparatus made by the Boynton Furnace Company. They secured the contract, although their bid was the highest. They are also installing a similar plant in the residence of J. S. Dodge, at Rose Ridge.

William Lockwood, clerk of the Master Plumbers' Association of New York City, informs us of the death of Paul G. Decker, an active member of the association, whose place of business is at 3204 Third avenue, New York. He died at his residence last Tuesday. He was one of the largest employing plumbers in the city, keeping from 75 to 100 men engaged throughout the year. His funeral will be from his late residence, 875 Caldwell avenue, to-day at 1.30 p.m.

A. A. Spear, a familiar figure in the Chicago Stove trade by reason of his long management of the Western department of the Magee Furnace Company, but for some time a member of the Spear & Douglass Heating Company, has engaged in the heating business on his own account at 54 Dearborn street, Chicago.

Thomas & Smith, 16 North Canal street, Chicago, have secured the contract for installing the steam heating plant in the new Chicago Public Library Building. An apparatus for purifying the water is included. The amount of the bid was $10,000.

T. J. Douglass succeeds the Spear & Douglass Heating Company, at 42 Dearborn street, Chicago, retaining the agency of the Richmond Stove Company, Norwich, Conn., and continuing in the installation of heating apparatus.

Pictet, the plumber who was injured in saving life at the Charity Bazaar fire in Paris and who received a gold medal for his bravery from the Government, was recently married in great style. He had ordered a ninth-class mass for the ceremony, but the parish authorities gave him a first-class wedding gratis, decorating the church and providing music. Many of the relatives of the persons burned attended.

Geo. A. Kiley, Hazleton, Pa., writes that he has the contracts for heating a three-story building of John W. Zierdt and a building for Mrs. Josephine Campbell, at Freeland, Pa., with hot water.

The Association of Master Plumbers of San Francisco, Cal., has elected the following officers for the ensuing year : President, C. W. Iredale, re-elected ; vice-president, John B. Butterworth ; corresponding secretary, J. L. E. Firmin, re-elected ; financial secretary, George Dallamore, re-elected ; recording secretary, Charles McCarthy, re-elected ; chairman of the General Committee, F. Koch, re-elected ; sergeant-at-arms, F. Brooks ; trustees, William Quinn, A. Newmark, George Meehan.

The Ferguson Hardware Company, Sault Ste. Marie, Mich., have a force of men engaged on their plumbing contract at the Upper Peninsula Hospital, at Newberry, in charge of A. McMillan. The contract will be finished by December 1.

Report of Montana State Commission on Heating.

The fourth division of the report of the Montana State Commission on heating is devoted to the use of hot air furnaces for warming schools and is given below.

IV. WARM AIR FURNACES.

The furnace system of heating is an indirect system under all circumstances. It can be divided into three classes:

1. Heating by furnace without ventilation.
2. Furnace heating and ventilation by the gravity system, and,
3. Furnace heating and ventilation by mechanical or hot blast system and fans to control the circulation of air.

Objections are raised to all heating and ventilating systems, and the warm air system is not an exception. It is urged against the first mentioned system that the joints will open by expansion and contraction of the highly heated metal; that the gases will escape into the hot air ducts and in the rooms to be heated; that the air, in passing through the furnace, becomes superheated, thus delivering impure air into the rooms.

Furnace heating without ventilation has nothing to commend itself except its economy in first outlay and the cost of maintenance. It is not durable. It is not clean. The furnace usually delivers air at a high temperature into the room, and as no provision is made for the exhaust of the air, occupants are oppressed with foul air, overheated, subject to drafts from open windows, which will be pulled down at the top, &c. It is a familiar story, and previous suffering has bred a general prejudice against the very name of furnace. Furnace heating, by either of the other methods mentioned above, is quite another thing, and, like an indirect system of steam heating, if properly introduced and introduced in proper places, will give the best results.

The gravity system of furnace heating and ventilation is really an exhaust system, but to distinguish it from a mechanical exhaust system it is called a gravity system. The successful operation of both heating and ventilation is brought about by gravity, which always causes a cooler strata of air to fall by its weight (by the attraction of gravitation) and a column of hot air to rise, by rarification (heat). In this system the furnaces are placed in the basement, most properly at the base of the brick air ducts leading to the rooms to be warmed and ventilated. At the extreme bottom of these flues or ducts and in the sides next to the furnace is an opening for the admission of cold air, and at the top of the furnace casing is another opening into the same flue for the admission of warm air. At the bottom of the warm air opening is a valve to control the admission of the air to the room above. If the valve is placed in another position all cold air will enter the room. By setting this valve at any point between the two extremes the temperature of the air can be regulated to any degree between the coldest outside temperature and the warmest air in the furnace chamber. The valve is controlled by a regulator in the school room, and the occupants of each room are thus able to control the temperature of the room and change it to any degree required, independently of any other room in the building. While this valve regulates the temperature it does not reduce the air supply going into the room, the supply being constant under all circumstances or conditions of the elements outside the builidng. The valve in the schoolroom can be operated by either hand or automatic regulation. The air supply for the schoolroom is taken from outside of building into a cold or fresh air room which is of easy access and the air supply is easily regulated. The room should

be kept sweet and clean. This will insure the delivery of the air through the furnace into the schoolroom in as pure a condition as it is out of doors.

The furnace which warms the air must be capable of warming an immense volume of air, and so thoroughly doing its work that no one portion shall be so heated as to favor certain rooms; simple in its construction so that its operation can be readily understood by the average janitor; so constructed that all joints will properly adjust themselves to the varied conditions of heat and cold; gas tight, and have a radiating surface that is properly proportioned to its grate surface. Consideration of these facts proves conclusively that it is not the furnace which by its superior construction concentrates the heat, or the furnace in which an intense heat can be quickly obtained, but a furnace which spreads the heat most evenly over the largest extent of heating surface with slow combustion, which are the points to be sought for. The successful operation of all indirect heating systems depends on the ventilation of the rooms, for the reasons that the impure air must be exhausted from a room before the pure air can flow in. Thus we see that ventilation is an aid to the heating and proper heating is an aid to ventilation. We have examined a great variety of furnace heating and gravity ventilating apparatus in the different cities, many of them working to perfection. The last method of heating and ventilation we will consider is a mechanical or hot blast furnace system. The following elements go to make up the complete apparatus:

1. Warm air furnaces set in a central location in a battery or separately at the base of the heat risers.
2. A fan to force or draw the air through and over the furnaces, and force it into the building through ducts and flues or heat risers.
3. A motor, which can be either an electric motor or a gas or gasoline engine or a water motor, with which to drive the fan.
4. A suitable system of flues, valves and registers to deliver the heated air at the desired points and control its supply.

The plenum system keeps the air in the furnace chamber, the air distributing ducts and the air in the rooms under a slight pressure, in this manner forcing it out at the different outlets provided for the escape of foul air. The exhaust system is the reverse of this, as it exhausts the air out of the rooms, and at the same time pulls the air from the furnace into them. In the majority of buildings the plenum mechanical system is to be preferred to the exhaust mechanical system.

We can best describe a mechanical or hot blast furnace system of heating and ventilation by giving a detailed description of a heating and ventilating plant which we visited in our investigations. From anemometer tests we found that there were from 30 to 40 cubic feet of air per minute being furnished each pupil, in each room, to the full seating capacity of each room; that the temperature was uniform at the same hight from floor, and that the difference in temperature between floor and ceiling did not exceed 4 degrees. The heating and ventilating plant is a combination of a plenum and a gravity system, but we were informed that unless the weather was very cold and windy it is not necessary to run any mechanical appliances, as the building heats and ventilates perfectly by gravity exhaust. In extreme windy weather the mechanical appliances are used, and uniform heating and thorough ventilation are secured, no matter what the condition outside. The building is warmed by six masonry furnaces set in a battery, in a central location. The fresh air supply to the furnaces is through an underground fresh air duct connecting the furnace chambers to the fresh air room. The fresh air room is arranged to take air from two directions, west and north. The heat risers to the different rooms are of brick and are arranged to furnish either warm or cold air through the same register, the cold air connections to the risers being brick ducts underground and the warm air connections being galvanized ducts overhead. In the fresh air room is located a fan to force the air through the furnace to the different rooms. This fan is used only in extreme bad weather. The fan is operated by a 5 horse-power motor. This system of ventilation is reinforced by coils at the top of the ventilating stack, the air from each room being exhausted into a ventilating flue or flues, all of these flues terminating in the attic. There the ventilating flues are all connected with a central foul air chamber by galvanized iron ventilating ducts, and the air is exhausted from this foul air chamber to the outer air through a galvanized iron ventilating top, made double to keep it from chilling. This ventilating top is 8 feet 6 inches in diameter. The assembly hall is the hight of both the first and second stories of the building, and is furnished with a stage and seats for 460 people. It is arranged to ventilate from the floor in cold weather and from the ceiling in warm weather, to keep it cool. With this arrangement, by running the fan and forcing the air into the room at a high velocity, and exhausting the air from the ceiling in warm weather, it will keep the room cool and comfortable.

NEWS AND NOTES.

Bristol, England, is to have a new dock at a cost of $7,500,000.

The London correspondent of the *Daily Post*, of Birmingham, England, says that advices received from St. Petersburg announce that an arrangement has been come to between a syndicate there and several of the Abyssinian traders who are visiting Russia to establish near Harrar, Abyssinia, a factory for turning out cheap cutlery, hardware and various kinds of small machinery. The syndicate, which is Franco-Russian in character, and with which M. Leontieff is said to have something to do, will find the money, and the traders undertake to get for the factory certain privileges, and to push its wares in Abyssinia, receiving as compensation a small interest in the enterprise.

The latest English trade papers received assert that the whole interest for the construction of the Hankow-Pekin Railway and other important works in China, which a Belgium syndicate acquired some months ago, has within the past few weeks passed into British hands.

The French official customs returns for the first eight months of this year show the value of imports into France in that period to have been $521,953,000, as compared with $519,548,000 in the corresponding period of 1896.

Completed railway returns for the United Kingdom, just published by the British Board of Trade for 1896, show a substantial increase of about $25,000,000 in net earnings last year as compared with 1895, reflecting the improvement in general trade which was experienced in that country last year. The passenger traffic yielded over $195,000,000; freight traffic, over $230,000,000, and miscellaneous traffic, over $20,000,000, the grand total being over $445,000,000, as against $420,000,000 in 1895. The tonnage of freight traffic showed an increase for the year of 22,000,000 tons. The paid up capital on all British railway stocks on December 31, 1896, was $5,145,000,000.

The fire losses in the United States and Canada for the month of September, as compiled from the returns of the New York *Journal of Commerce*, aggregated $9,392,000, as compared with $6,454,950 in the previous month and $8,200,650 in September, 1896. This brings the total fire losses for the first nine months of 1897 up to $80,413,700, as compared with $90,880,700 for the corresponding period of 1896. The September record is swelled by eight serious fires, each contributing over $250,000.

The Grand Central Railroad Station in New York City is undergoing some important extensions and improvements, involving a cost of about $1,000,000. The enlargements are being carried out in such a way as not to interfere with the immense railroad traffic which enters and leaves the station. The present alterations will take some seven months to complete.

The regular October report of the *American Agriculturist* places the 1897 wheat crop of the United States at 589,000,000 bushels from an acreage of 39,167,000. For 1896 the yield was 470,000,000 bushels from 37,156,000 acres. The report says that the winter wheat crop is deficient in but two States, Illinois and Missouri, and that in every other State the rate of yield is above the average for a long series of years. The total wheat crop is, with one exception, the largest ever grown. The corn crop of 1897, on the contrary, is barely up to the average, owing to the serious decline in condition which took place during the month of September, the general average falling from 82.03 to 78.09. It is calculated that a total of 1,750,000,000 bushels will represent the outside figures of the crop. Last year's corn yield was 2,283,875,000 bushels.

A prominent smelting company in Monterey, Mexico, have notified their workmen that in future they will be paid in silver instead of gold, at the rate of two Mexican silver dollars for one of gold.

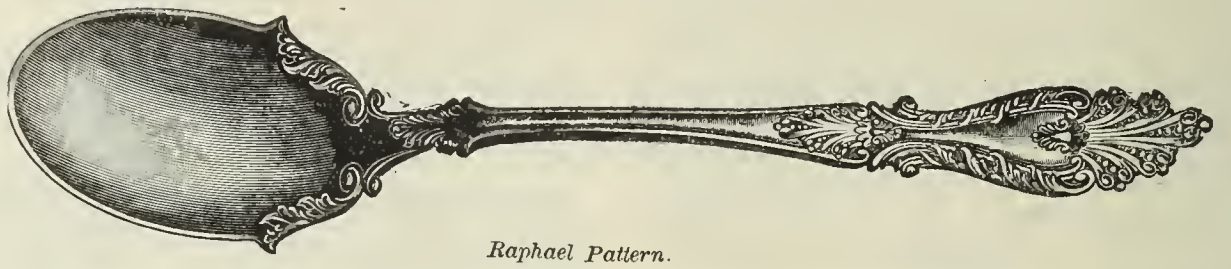
The stock of gold in the United States at the present time, according to the estimate of Mint Director Preston, is larger than ever before in its history. Mr. Preston calculates that on October 1 the gold in the country aggregated $712,660,000, an increase of $15,541,000 since August last, and larger by $1,000,000 than that reached in October, 1888, the greatest previous total. It is estimated that by the end of the current calender year there will be in the United States between $750,000,000 and $760,000,000 in gold, a grand total largely in excess of anything ever known.

A cable dispatch from London, England, states that the Executive Committee of the Amalgamated Engineers' Society threaten to withdraw the engineers in the ocean mail service in the event of a continuance of the present dispute in the British engineering trade. Such action, if carried out, would have a very serious effect on international commerce.

THE RETAIL STORE.

Raphael Pattern.

The Rogers & Hamilton Company, Waterbury, Conn., are marketing the Raphael pattern in flat ware recently brought out by them, the illustration showing an ice cream spoon, exact size. This particular design is made in the Rogers & Hamilton brand. A full line is made, including spoons and forks, and a large variety of fancy pieces for serving fish, meat, fruits, creams, &c.



Raphael Pattern.

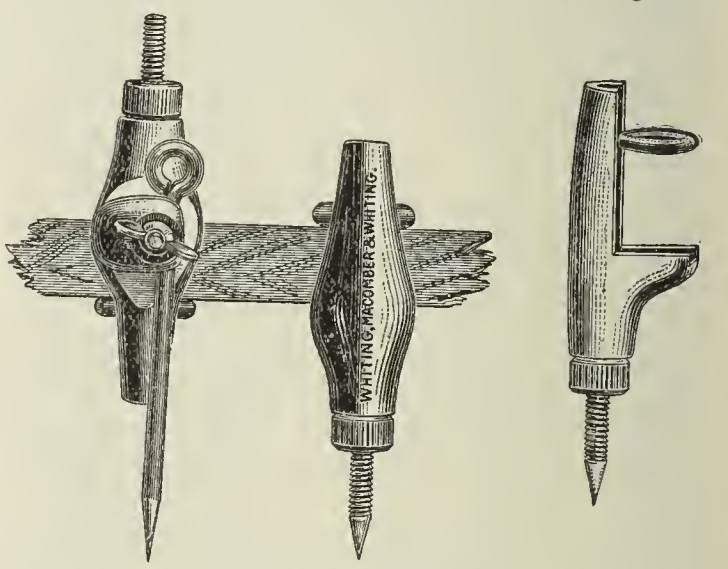
The Boss Sidewalk Cleaner.

The accompanying cut represents a sidewalk cleaner brought out by Withington & Cooley Mfg. Company, Jackson, Mich. The cleaner has a heavy steel blade, tempered and polished and set to a strong handle, the whole being neatly finished. The special shape given the blade adds much, it is stated, to the usefulness of the tool, as when it is held with the concave side toward the user it makes an excellent chopper, and by reversing it the blade hangs just right to slide under the ice to pry it loose or to shave it off the sidewalk. It is pointed out that the tool is made heavy for rough use, and that it is made without fancy finish so as to place it in the hands of everybody at popular prices.

The Boss Sidewalk Cleaner.

Whiting's Adjustable Trammel Heads.

Whiting, Macomber & Whiting, South Framingham, Mass., are putting on the market the trammel heads herewith shown, the detached one at the right of the illustration being a side view of one of the heads. They can be carried in the pocket, as no special beam is needed, the heads being readily adjustable to any strip of molding, yard stick, rule, lath or straight edge—in fact, it is remarked, to anything not over an inch thick, the width being immaterial. The heads may be used with the hardened steel point, and a slot is also provided in which may be inserted an ordinary lead pencil of any length, or a ruling pen, without removing the point. The clamp for the point and pencil is pivoted and is fastened by a thumb screw so as to allow a play of two or more inches for fine adjustment without moving the heads on the beam. In emergency these heads, it is explained, may be used as small head clamps. The makers state that in addition to the foregoing advantages the heads have all the usual features of the best tools of this class, that they are gotten up nicely for the use of manufacturers, architects, draftsmen, while the price is comparatively low in proportion to their scope and adaptability.



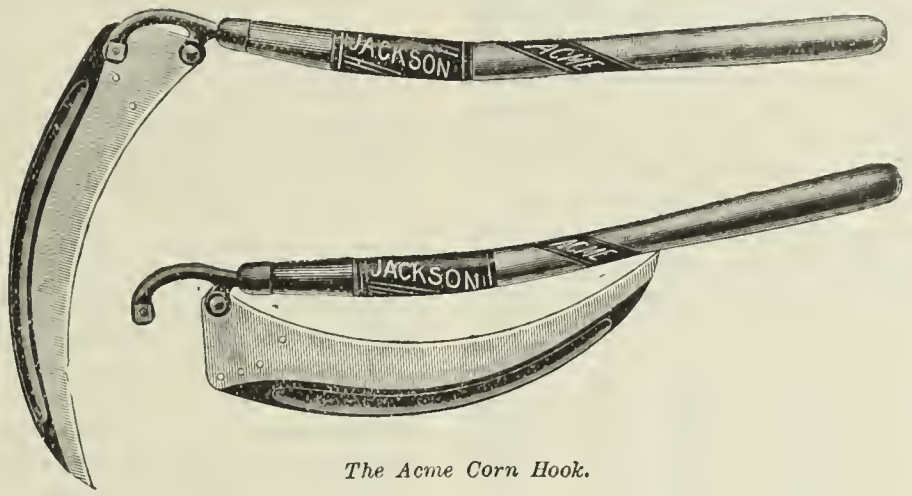
Whiting's Adjustable Trammel Heads.

Pike Mfg. Company, Pike Station, N. H., are representing the Chicago Pumice Company, Chicago, Ill., in the territory east of Buffalo in the different States. This company manufacture a fine grade of pumice in a number of forms, guaranteed to be pure and free from substitutes. Among their production is powdered pumice put up in packages of 1 and 5 pounds, as well as in bulk packed in barrels. There are also bricklets for toilet purposes and coarser work, such as scouring marble, tiling, mosaic floors, &c., the sizes being 2¾ x 1⅝ x 1 and 5 x 3 x 2¼ inches respectively. There is in addition an extra quality for toilet use put up one each in handsome pink boxes, the stone being oval in shape 3¼ x ⅞ inches.

The Hardware firm of H. W. Plambeck & Co., Moline, Ill., consisting of H. W. Plambeck and C. A. Berglund, have changed the style to Plambeck & Berglund. They have recently moved into their new store building, 1417 and 1419 Fifth avenue. The building is 40 x 90 feet, two stories, with basement. The first floor will be used as a salesroom, the basement for plumbing, while the second floor will be used as a tin shop and storage room for surplus stock.

The Acme Corn Hook.

The accompanying cuts represent a corn hook put on the market by Withington & Cooley Mfg. Company, Jackson, Mich. The hook is shown open for use, and closed for shipment and storing. The blade is ribbed and is referred to as of high grade knife steel and tempered each by itself, so that it may take a sharp edge. The attachment permits of a protection to the lower end of the handle by means of a ferrule and cap. The handles are also made with what is known as the apple knob on the upper end. This is to give a more secure grip for the user. The shank of the blade is made of steel, and the adjustable feature is described as perfect and the hang correct. The hook weighs 16 ounces, and they are packed in boxes of 1 dozen each. The point is made that the tool can be used as a hook or knife to suit the fancy of the user.



The Acme Corn Hook.

MEMORANDA.

The Toledo Tinware Mfg. Company, Toledo, Ohio, have just completed a thoroughly modern and well equipped Galvanizing plant in connection with their works.

The L. W. Hemp Mfg. Company, St. Louis, Mo., propose to put up a large Tinware factory in that city.

Patterson, Godfried & Hunter, 146 Centre street, New York City, are sending out a circular relating to the Snedeker Quick Adjusting Screw Vise, which should be of special interest to machinists and pattern makers. The circular shows broken views of the Vise, so that its movement can be readily understood, and gives a full explanation of its operation.

The G. W. Hazel Company of Church street, New Haven, Conn., made a very fine display of Stoves, Ranges and Kitchen Utensils, which they handle in great variety, at the third food exhibit, recently held at the Armory in that city. Prominent features of the exhibit were the Franconia and Art Royal Ranges, large numbers of which are in use in the city of New Haven and vicinity. The company also showed a full line of the Plymouth and Oakland Parlor Stoves, together with an interesting assortment of Cooking and Kitchen Utensils. One thing in particular which attracted much attention was a new Coffee and Tea Pot, with detachable handle which prevented it from becoming hot and burning the hands. A feature of the exhibit was the lectures by Mrs. Rorer on culinary subjects, and in her cooking operations the Franconia Range was employed.

Lewis & Gay, retail Hardware and Tinware, Wyalusing, Pa., have been succeeded by J. B. Lewis & Co., A. B. Lewis purchasing Mr. Gay's interest. The building which the firm occupy is a new one, having been opened on July 1 last.

Miller & Son have succeeded William Broughton in the retail Hardware, Stove, Tinware and Sporting Goods business, at Walnut, Kan.

W. A. Talmage is building a new Hardware store at Red Lodge, Mont. Mr. Talmage is a wholesaler and retailer of Hardware, Stoves, Tinware, Sporting Goods, &c. The building will be of stone, the main floor being 50 x 100 feet in dimensions. Mr. Talmage will use the Warren shelving.

In our trade columns this week details are given of an important cut in the price of Sheet Aluminum just made by the Pittsburgh Reduction Company. The reduction runs all the way from 6 cents a pound in the heavier gauges—the base price being lowered from 46 to 40 cents—to as much as 25 cents in the lighter gauges. This radical reduction in the price of the sheet metal is calculated to give a strong impetus to the manufacture and sale of Aluminum Kitchen and Household Utensils. The price of Ingots has also been reduced 3 cents a pound, No. 1 Aluminum, 99 per cent., pure, being quoted now, in 100-pound lots, at 36 cents instead of 39 cents.

L. Weaver & Co., Hico, Texas, have succeeded the Estate of A. F. Sellers in the Hardware business at that point. The stock comprises Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c., in which a wholesale and retail trade is done.

The Secretary of the Navy at Washington has advertised for bids for the construction of a sailing vessel as a practice ship for the cadets at Annapolis Academy. The vessel will be bark rigged, of 1100 tons displacement, 175 feet long, 27 feet wide and 16½ feet draft. Although her motive power will be sail, she will be equipped with machinery for steering, also with dynamo, condensers, &c.

A private trial of the submarine wrecking boat "Argonaut," built by the Columbian Iron Works, Baltimore, Md., after the design of Simon Lake, the inventor, was made last week in the dry dock of the Columbian Iron Works, and is reported to have been completely successful. The "Argonaut" was submerged in 21 feet of water, remaining under the surface for two hours, during which time constant communication was kept up by means of a rubber tube with the six men who were in the vessel's cabin and engine room. The crew stated that during the entire time they suffered no inconvenience from lack of fresh air. A number of tests of the engines of the vessel were made, and while the trial was merely preliminary, it is claimed that enough was learned to make it certain that the boat will be able to perform the work for which she is designed—namely, the recovery of cargoes from sunken vessels and any other work of a submarine character.

The Union Iron Works, San Francisco, Cal., are building for the Pacific Coast Steamship Company a fine new 13 knot vessel for the company's Mexican route. The new boat, which is to be named the "Senator," will be 288 feet long, 38 feet wide and 21 feet in depth, and will carry 1500 tons dead weight. It is expected to be ready for service by next March.

At the annual meeting of the stockholders of the Amoskeag Mfg. Company, held at Manchester, N. H., last week, the report was made that on the whole the last year was the worst in the cotton manufacturing industry ever experienced, the corporation losing $123,382 as a result of the year's operations. The prospects, however, were reported as brighter than for some time past.

A new boat which has been recently added to the Havre-Rouen-Paris line of steamboats in France is fitted with gas engines, and is stated to be a complete success. The vessel is 100 feet long and 7 feet draft. It is divided into four water tight compartments, and has a two-cylinder 40 horse-power engine, capable of maintaining an average speed of 7 knots an hour. The gas for use in the engine is supplied from shore, and is stored in a steel holder with an accumulator composed of steel pipes under a pressure of 95 atmospheres.

Secretary of the Navy John B. Long has prepared and submitted to the Secretary of the Treasury, for transmission to Congress, the estimates for the support of the Navy for the next fiscal year. The aggregate to be asked for is $31,991,727, of which $8,565,000 is for increase in the naval force.

TIN PLATES.

Nine Months' Tin Plate Imports.

The official returns published by the British Board of Trade record the total September shipments of tin and terne plates from British ports to the United States as 4656 tons, as compared with 3526 tons in the previous month, and 7167 tons in September, 1896. This brings the total exports of Welsh tin plates to this country during the first nine months of the current year up to 64,746 tons, a decline of 25,787 tons from the figures of the first three quarters of 1896. The steady shrinkage which has taken place in the importation of foreign tin plate since the rise and development of the American industry is very marked. The following table shows the amount of such imports by months for the first three quarters of the five years, 1893-1897. The figures represent tons of 2240 pounds :

	1897.	1896.	1895.	1894.	1893.
January	8,810	11,861	18,626	18,296	23,498
February	9,678	6,980	23,201	13,413	20,190
March	10,358	8,903	18,743	16,907	31,334
April	8,146	10,903	15,946	13,210	31,651
May	6,916	9,222	18,118	21,291	26,988
June	7,172	11,753	13,760	17,247	26,759
July	5,484	13,930	16,445	17,805	22,248
August	3,526	8,814	23,531	19,125	15,784
September	4,656	7,167	17,507	17,672	13,789
Totals, tons	64,746	90,533	165,877	154,966	212,241

The Development of the Tin Plate Industry.

It looks as though capital were going into the tin plate industry with a rush, which may seem inexplicable when the low prices are considered at which tin plate has been sold for some time past. Since the publication of *The Metal Worker's* quarterly tin plate lists, October 2, which showed a total of 233 mills, finished or building, some important additional enterprises have started and others are talked of, among them being the 30-mill plant of the Shenango Company, a four-mill plant at Johnstown, Pa.; a six-mill plant at Martin's Ferry, Ohio; a four-mill works at West Leechburg, Pa., and an eight-mill works at Sharon, Pa This means an additional capacity of at least 1,250,000 boxes per annum, so that we are amply able to cover our own requirements.

There is a tendency developing toward concentration of the business in larger plants. The unit of product so far as tin plate manufacture is concerned is very small, being about 25 to 30 tons per mill per week. At the other end, the steel works and the tin plate bar rolling mill, the unit is relatively very large. A modern Bessemer plant is not doing much if it is not turning out 5000 to 6000 tons per week, while the unit in open hearth steel manufacture, a 30-ton furnace, will cast 350 tons of ingots a week, and a four-furnace plant is probably as low as any one would go in designing works. A modern sheet bar mill rolling in one heat from the ingot could easily take care of 2000 to 2500 tons per week. At the first blush it would seem natural, therefore, that the manufacture of tin plate bars would be confined to the large steel works, because they alone could handle such large quantities to best advantage.

But the matter seems to be working in a somewhat different way. Some of the tin plate makers have started in to make their own steel, and naturally choose the open hearth furnace, because it is a smaller unit, and because it is supposed to possess other advantages. Such plants must grow at the tin plate end in order to run the steel plant and the ingot rolling plant to best advantage.

The industry has been attacked also on the other end, particularly by Bessemer plants who must seek an outlet for a part of their tonnage. The temptation to add a tin plate department is great, and naturally in that case the undertaking is gone into on a relatively large scale. All this contributes to a lowering of cost which more firmly intrenches our young American industry. It has, besides, made marked progress in technical details and in management over the practice of the Welsh competitors.

The Johnstown Tin Plate Company.

J. W. Place of J. W. Place & Co., bankers, 69 Wall street, New York, advises us that arrangements have been concluded with the Johnstown Board of Trade for the erection of the proposed tin plate works at Johnstown, Pa., in which his firm are interested. A contract has been placed with the Totten & Hogg Iron & Steel Foundry Company, Pittburgh, Pa., for the entire plant from the ground up, including a structural steel building, boilers, engines of the improved Ætna-Corliss type, pumps, rolls, furnaces, cranes, floor plates, heaters, mills, shears, pickling machine, &c. Work on the foundations for the building has already begun, and it is expected that the entire plant will be finished soon after January 1 next. Two hot mills will be installed at first and four more will be added soon after, making a six mill plant. A suitable equipment of tinning machinery will also be put in, the company proposing to tin their own black plate for the market. Associated with J. W. Place & Co. in the enterprise are N. D. and J. D. Lewis, who were formerly engaged in the manufacture of tin plate in Wales, and who have recently been connected with the Great Western Tin Plate Company, Joliet, Ill., N. D. Lewis having been superintendent of that concern. The corporate title of the new enterprise will be the Johnstown Tin Plate Company.

The Shenango Tin Plate Company.

The principal contracts have been placed for the new tin plate plant to be erected by the Shenango Tin Plate Company at New Castle, Pa. Reference to the plant of this concern, which will be the largest in this country, has already been made in these columns. The contracts already placed call for the building of 30 hot mills and 28 cold mills, the latter to be driven tandem. The hot mills will be 26 inches in diameter and vary in length from 30 to 36 inches. The cold mills will be 22 inches in diameter and from 26 to 36 inches long. The contract for these mills has been placed with Mackintosh, Hemphill & Co. of Pittsburgh, and they are to be completed in four months from the time of signing the contract. The order for the engine to drive the mills has been placed with J. Weidman Murray of the Pittsburgh office of E. P. Allis & Co., engine builders, of Milwaukee, Wis.

As already noted, the contract for the buildings, which will be of steel and iron, has been given to the Shiffler Bridge Company of Pittsburgh, but the actual dimensions of these buildings have not as yet been determined upon. There will be one main building, containing the hot and cold mills, which will be probably 1600 feet long, although it may be divided into two sections. There will be another building about 600 feet long, and other smaller buildings containing boiler house, engine room, &c. It is expected to have this plant ready for operation about April 1, 1898, although the work of construction may extend beyond that date, depending largely on the kind of weather during the winter.

The stockholders of the Shenango Tin Plate Company are largely identified with and owners of the New Castle Steel & Tin Plate Company, Shenango Valley Steel Company, New Castle Wire Nail Company and two blast furnaces at New Castle, and negotiations are now under way looking to a consolidation of all these interests into one

concern and under one management. There are a great many details yet to be arranged, but it is probable the consolidation will be effected between now and the first of the year.

SCRAP.

"The whole thing in a nutshell" is the quotation on the back of a blotter illustrated with a nutting woodland scene, the blotter being issued by the Follansbee Brothers Company, Pittsburgh, in the interest of Scott's Extra Coated Guaranteed Roofing Tin.

The Humbert Tin Plate Company, South Connellsville, Pa., are considering the advisability of increasing their works to a six-mill plant. The mill buildings and machinery were originally planned and put up with a view to the ultimate enlargement of the plant from four to six mills.

A press dispatch from Sharon, Pa., states that the Tin Plate works which were in contemplation at that place will soon be erected. The company engaged in the enterprise are said to be composed in the main of local capitalists, but some outside parties are also interested. It is proposed to put up a ten-mill plant near the Sharon Iron Works.

We are advised by the Lalance & Grosjean Mfg. Company, New York City, that the report that they have decided to enlarge their Tin Plate plant at Harrisburg, Pa., by the addition of more hot mills is unfounded. Should business require an extension, they may do so later on, but at the present time the company are not contemplating any move in that direction.

A scarcity of Charcoal Tin Plate is reported in Canada, stocks being generally very light throughout the Dominion. It is regarded as doubtful whether orders recently placed with the Welsh makers for this material can be filled before the close of navigation. Consequently the scarcity is likely to become still more pronounced during the winter.

The contract for the construction work on the new 30-mill Tin Plate plant to be erected by the Shenango Tin Plate Company, near New Castle, Pa., has been awarded to the Shiffler Bridge Company, Pittsburgh, Pa., at a figure slightly over $90,000. The contract calls for two immense brick and steel buildings, the main one being 1650 feet long by 100 feet wide and the other 700 feet long by 60 feet wide. The buildings are to be completed by January 1. Contracts for a large part of the machinery and equipments are likely to be placed within a few days. The site for the plant will probably be south of New Castle, between that city and Mahoningtown. There is some thought of building an open hearth plant in connection with the works.

The American Tin Plate Company on the 4th inst. began the construction at Elwood, Ind., of two additional hot mills, which will make their works at that place a 20-mill plant. They also have six mills at Montpelier, Ind.

The Riter & Conley Company of Pittsburgh have the contract for the new buildings for the West Leechburg Steel & Tin Plate Company, to be erected at West Leechburg, Pa. The main building will be 100-foot span by 225 feet long by 20 feet high to the square of roof, and the boiler house is 34-foot span by 48 feet long by 14 feet high. The main building is to have brick wall 6 feet high and 175 feet long on each side. The balance of sides, gables and partitions to be corrugated iron and the roof is to be covered with sea green slate on wooden sheeting. Two partitions will extend entirely across the building, dividing same into a furnace room 50 x 100 feet and cold mill room 150 x 100 feet and machine shop 25 x 100 feet. Continuous sliding windows are provided on the side and swinging windows in a monitor 30 feet wide running the whole length of the building. The boiler house is to be of simple but substantial construction and entirely covered with corrugated iron.

In the Welsh Tin Plate industry production is still very much reduced, there being a large number of mills standing idle through strikes and disputes. Among them are several works that it is feared have come to a permanent stoppage, and will have to be reconstructed before they can be set going again, if ever the demand for Plates will sufficiently arise from other countries to make up for the loss of trade with America.

The Ellwood Tin Plate Company, Ellwood City, Pa., have ordered from the Whiting Foundry Equipment Company, Harvey, Ill., a traveling crane of 6000 tons capacity with compressed air motor and two air hoists.

The Ætna-Standard Iron & Steel Company, Bridgeport, Ohio, who recently took over the Bessemer steel plant of the Junction Iron & Steel Company, at Mingo Junction, Ohio, will remodel some departments of the plant and add considerable modern machinery.

The rate of freight on sheet bars and tin plate bars from Lorain, Ohio, to Cumberland, Md., has been established at $2 per gross ton.

At the annual meeting of the stockholders of the Canonsburg Iron & Steel Company, Canonsburg, Pa., held a few days ago, H. H. Nieman was elected president, H. S. Duncan vice-president, John F. Budke general superintendent and L. A. Meyran secretary and treasurer. It is reported that the company's Tin Plate plant is running full in all departments with a large number of orders on their books.

At the time when the Dingley Tariff bill was under discussion and the fate of the rebate clause in connection with re-exported Tin Plate was in the balance, there was much talk of the likelihood of the Standard Oil Company putting up an immense Tin Plate plant to manufacture their own material for the cans in which their oil is exported, in the event of the drawback being disallowed. The passage of the new Tariff law with the rebate clause incorporated in it seemed, however, to have laid the rumor to rest. Recently the name of the Standard Oil Company has again been brought forward in this connection. A well defined rumor, which has gained wide newspaper currency, credits that huge corporation with the intention of erecting a Tin Plate plant on a very extensive scale on their property at Hite's Station, on the West Penn division of the Pennslyvania Railroad, at a point on the Allegheny River opposite New Kensington, Pa. The company have a disused oil refinery at that place, which they are now dismantling and tearing down preparatory, it is said, to clearing the ground for the erection of a 24-mill Tin Plate plant thereon. Inquiries at the headquarters of the Standard Oil Company in New York City have failed to secure a corroboration of the report, however, and it is generally discredited by authorities in the trade.

It is reported that the Berger Mfg. Company, Canton, Ohio, manufacturers of Sheet Metal Roofing, Cornices, &c., are adding a tin house to their establishment. One tinning stack will be in operation by November 1. The company propose making a special grade of Terne Sheets in long lengths.

Perforation of an Iron Plate by a Clay Plug.

A curious illustration of the power of light matter to perforate more substantial substances when driven at a high velocity is described by the *Engineer* as having occurred in the Royal Arsenal a few days ago. In the course of experiments on firing gas in mines, conducted by Captain Cooper Key, a special gun is employed to do duty for a bore hole with a charge of high explosive, and pressed cylinders of raw dry clay 3 inches long and 1⅞ inches in diameter are used to represent tamping. These "shots" are made to act in various mixtures of air, coal dust, gas, &c., and to stop the course of plug, &c., eventually a cast iron target plate 1 inch thick was placed 25 feet in front, at an angle of 45 degrees, in order to break up everything into dust and throw it upward. After three or four shots with this arrangement the clay plug, weighing 7½ ounces, perforated the inch iron plate, and the hole thus made has been steadily extended since. The familiar tallow candle passing through a door must hide its head before a 7½ ounce plug of clay perforating an iron plate an inch thick at an angle of 45 degrees. Doubtless the velocity must be tremendous. The calculated velocity for a hard cylinder of this weight and size to cut through an inch wrought iron at 45 degrees would be over 1800 foot seconds. With cast iron and clay and the three or four repeated blows everything is so greatly altered that there is little more to be said than that the effect is remarkable and unexpected.

A cable dispatch from London, England, says that the secretary of the Federated Trades, comprising 30 important industries, announces that the Executive Committee has definitely decided to call out all its members, in sympathy with the struggle of the engineers against their employers, on Friday next, when, it is estimated, a total of 400,000 men will be out of work on account of the great labor dispute.

Plans are being formed for another electrical exposition to be held in the Madison Square Garden, New York, in the month of May, 1898. A company for the purpose were incorporated last week at Albany, N. Y. M. Nathan, the general manager of the last electrical show, will have charge of the forthcoming exposition.

The semi-centennial of the city of New Bedford, Mass., is being celebrated this week. The central feature of the celebration is an industrial exposition, illustrative of New Bedford's prominence in the manufacturing world, which was opened on Monday. President McKinley touched a button at Washington and set the machinery in motion.

STOVE TRADE NOTES.

COKE AS A DOMESTIC FUEL.

We print an article this week from the "Weekly Letter of the Anthracite Coal Operators' Association," which will interest stove manufacturers, more especially those in the East, for it has to do with the question of substituting other fuels for anthracite for domestic purposes. Anthracite is practically the only coal known to domestic economy in the East, and the average householder, unless he happens to be interested in manufacturing lines, really forgets that there is such a thing as bituminous coal in existence. But though soft coal is not used in Eastern households, the fact remains that it is the great fuel of the country and of the world, and that hard coal is of small importance in comparison with it. The objections to soft coal are plain, and where anthracite can be obtained at a reasonable figure the former fuel, with its dirt and heavy smoke, choking flues and polluting the atmosphere, will not gain a foothold. If, however, the experiment of a by-product coke plant to be erected near Boston, producing what is known as a soft or semi coke, is carried out successfully, and the coke is pushed in the New England market as a fuel for domestic purposes, it must have an important effect on the anthracite trade and may force some modification in the planning and construction of cook stoves and heaters. To the ordinary oven coke there are certain real or fancied objections which have prevented its general introduction. Even this hard coke, however, is not a novelty in heating or cooking, but nowhere that we know of has its adoption become general, though soft coke from Pennsylvania ovens is used to some extent for these purposes. The general objection is that coke is harder to light, that it makes a hotter fire than coal, and that it requires more frequent replenishing. It is not impossible, however, that the proper regulation of air would temper the heat to the average of a coal fire, and that controlled in this way the fire would last reasonably long.

It is well to bear in mind in this connection that the housewife, or whoever attends to the fire, is apt to measure the consumption of fuel by the number of scuttlefuls a fire takes, and this standard of comparison would be very much at fault where coke is concerned, as it averages perhaps not more than half the weight of coal, bulk for bulk. If the experiment in making semi-coke for fuel be successful near Boston it will probably be repeated in the neighborhood of other large cities, and there is no reason why, if turned out at a comparatively low figure through the utilization of the by-products, say at one-half to two thirds the cost of anthracite, it should not supplant that coal in the East. Of course, one important fact to consider is that in any form it is a new fuel, and the people of New England, where it is proposed to introduce it, are more conservative than those living in the West; so apart from coke's efficiency and cheapness as a fuel there will be the great trouble of making the people take up with coke merely because it is new.

Circulars which are being distributed by J. A. Woodruff & Son of Salem, Ohio, call attention to several of their specialties in the heating and cooking line, prominence being given to the Salem Hot Blast Parlor Stove, made in two sizes, for which strong claims are made. The air is admitted in front, passing both ways around the fire pot to a point in the rear of the Stove, where an opening in the center ring allows the air to pass upward and under the shield above the fire pot, admitting it to the fire in a highly heated state. The Stove is made with cone center clinkerless grate, air tight steel body and nickel trimmings The Excelsior Range also receives attention, this being offered in attractive dress in two sizes. It is intended for burning wood or coal, and one of the features to which the manufacturers refer especially is the large feed opening. Other interesting points are sectional top, oval fire box, extra heavy linings, draw out hearth, deep ash pit with ash pan and heavy cut top long center.

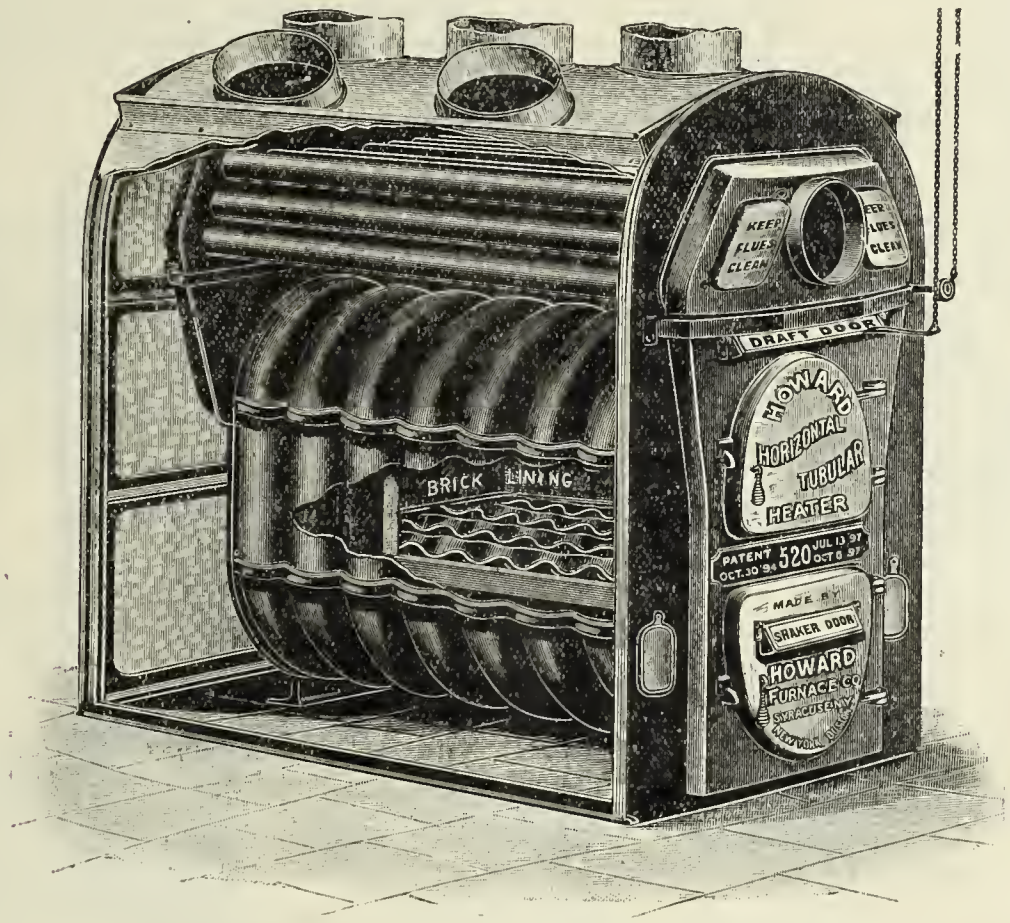
Foundrymen's Defense Association.

At the regular monthly meeting of the Foundrymen's Association held at the Manufacturers' Club in Philadelphia on Wednesday, October 6, W. H. Pfahler, chairman of the Committee on Defense appointed at the convention of the National Foundrymen's Association recently held at Detroit, addressed the gathering in regard to the progress made by his committee. He said: "Acting under the instructions of the convention the committee appointed to canvass the matter have been in correspondence with a large number of manufacturers, nearly all of whom they found evinced a desire to take up the subject and work out the problem of defense. There seems to be no doubt in the minds of those we have corresponded with as to the advisability and little doubt as to the practicability of the formation of a defense association. I called a meeting of the committee here about two months ago, and after a two days' session we believe we reached a line of formation which will be acceptable to the foundrymen. We at once commenced correspondence with about 200 of the leading foundrymen of this country, selected at random, asking them if they were sufficiently interested in the matter to attend a meeting for a discussion of the subject. Although that invitation to a discussion has only been out about ten days, we have already over 100 acceptances. I have, therefore, called a meeting to be held in Cincinnati at the time of the meeting of the Western Foundrmen's Association the week after next, which will get those founders located west of Ohio to attend, and in November we expect to have a meeting in the East. Between those two meetings we have little doubt but what we can formulate a plan which will be acceptable. It is the purpose of the committee after those two meetings to have a general meeting for the purpose of adopting by-laws and putting the association in working shape. I found in New England especially, where there was formerly a great aversion to anything of the kind, the strongest advocates to-day in favor of an organization which will be counter to the organization of the employees, and the idea that such an organization as the former must be antagonistic is dying out, because to-day the warmest advocates in its favor are to be found among the laboring men themselves. They realize that in an organization such as contemplated they will have a strength against agitation and the agitators, who are in the minority always in the labor columns. There is not 20 per cent. of the members of the Molders' Union to-day who are in favor of a strike, and yet that small percentage could bring about a strike. With the manufacturers organized they will have a support which is always maintained. The committee are very much encouraged with the work that has gone on so far, and I hope after the meeting in Cincinnati to be able to report a great deal of progress."

"Sure Winners for Fall" is the suggestive title of a folder just issued by the Eclipse Stove Company, Mansfield, Ohio, the winning feature being further emphasized by a panel picture at the top of the front page representing a football game in progress with the ball dangerously close to one of the goals. The features, however, that will interest the Stove dealer are found in the shape of new lines of Cooks and Ranges, some adapted for using wood only and others intended for burning coal. The Leader Eclipse, four-hole wood Range, has new decorative features of modern design and is made in two sizes. The Beacon Eclipse is similarly ornamented, but is intended for burning coal. Illustrations are also given of the Globe Eclipse Wood Cook, Comet Eclipse Coal Cook, Triumph Eclipse Steel Range, Postal Eclipse Cook, Peerless Eclipse Coal and Wood Cooks, Herald Eclipse Sheet Iron Air Tight Heater, made in two sizes; Perfect Eclipse Coal Stove, made in four sizes; Mars Eclipse Junior Oak, made in five sizes; Carbon Eclipse Air Tight Parlor Heater, made in three sizes, and the Matchless Eclipse Wood Base Heater, made in two sizes. The company are also distributing a blotting pad having a smooth face and embellished with illustrations of a Cast Iron Range and a Steel Range. Accompanying the illustrations are invitations to send for catalogues and discounts and suggestions about business.

The Howard Horizontal Tubular Heater.

A warm air heater of novel construction, simple in its arrangement of parts and provided with the most economical and labor saving attachments, has just been brought out by the Howard Furnace Company of Syracuse, N. Y. The body is made in cylindrical form, corrugated, the lower part forming the ash pit, the middle section the fire pot, which extends the entire length of the heater, and the upper section the dome. At the rear end of the heater a connection is made with the tubular radiator, which surmounts the body, and through which the products of combustion pass to the front and thence escape to the smoke pipe. The radiator is made of a series of 2¼-inch boiler tubes, the combined area of which is equal to the area of the smoke pipe, so as to insure the positive use of every tube, with the resulting utilization of all the radiating surfaces. The broken view of the heater which we present in the accompanying illustration gives an idea of the general arrangement of parts. It will be seen that there are three rows of tubes one above the other, so arranged that the air to be warmed is obliged to pass in a circuitous manner between the tubes, which are 1 inch apart. In making the radiator, as well as other parts of the heater, ample provision has been made for expansion, thus insuring a gas and dust tight construction. The check damper, which also acts as a dust damper, is located near the top of the hollow front, and when opened forms a connection between the ash pit and the front radiator head. The manufacturers refer to the ease with which this furnace can be cleaned, the opening of two doors in the front radiator head giving access to all the tubes. The fire pot is lined with brick, the construction of which is such as to form a hot air blast, which not only increases the heat but prevents smoke from soft coal. When it is desired to use wood as a fuel no lining is placed in the fire box, but the same grate is employed as in the case of coal. The hollow front is made on the well known air tight principle, which insures the holding of a wood fire an unusual length of time. The line of heaters here illustrated is fitted with the company's new four-bar corrugated grate, which embodies new features of construction. It is made in corrugated form with four projections, or spines, every other corrugation on each spine or projection having a perforation to admit air. By reason of its peculiar shape the grate bar is very strong, thus lessening the liability of warping and burning out. The bars rest in a removable frame, which in case of repairs can be easily taken out and new bars substituted without the use of a bolt, screw or key. The Howard horizontal tubular heater is at present made in three sizes for hard and soft coal and three sizes for wood, in portable form only, also three sizes combination warm air and hot water. The manufacturers inform us that three larger sizes are in course of construction, and will be ready next spring. Every Howard furnace has a special brush for cleaning the radiator, a sanitary porcelain lined vapor pan and the Howard patent silver aluminum damper regulator with tested thermometer.



The Howard Horizontal Tubular Heater—Broken View.

Chicago Stove Trade.

The demand for stoves at Chicago has shown decided improvement within the past week. Much depends upon the weather in the stove trade, and for four weeks or more the persistent mildness of the season undoubtedly proved a potent factor in withholding orders which should have been sent in to the manufacturers by dealers. The drought also had a deterrent effect, as farmers had begun to fear that it would be prolonged until serious damage would be inflicted over the entire West. Copious rains have relieved the situation, the air is more bracing on the prairies, and again stoves have come in favor. A sharp cold wave would, it is believed, result in a perfect avalanche of orders, as stocks in dealers' hands are known to be very small.

John P. Ley, the New York representative of Charles Noble & Co of Philadelphia, Pa., has some new attractions at his sample rooms, at 239 Water street, New York. The trade who have used the Busy Bee Range for a number of years will be pleased with the new dress in which it is now presented. This popular Range has a new design, is ornamented with nickel and retains all of its well-known excellencies. The Liberty Oak has been set up in the store by Mr. Ley, so that it can be shown in operation to those interested in this popnlar type of heating Stove. He is also preparing to make an active campaign on the Game Oil Heaters. These Heaters are attractively ornamented with nickel, show a large mica illumination and have given evidence of a substantial heating capacity.

George W. Starrett, Beekman and Water streets, New York, is calling the attention of his trade to Moore's Air Tight Heater, the Richmond line of Ranges, and the Craig Steel, for which he is the New York representative. He points to a Craig planished steel smoke pipe used in connection with a combination Hot Air and Hot Water Heater, which also has a steel radiator, and which has been in use for five years. The stove pipe runs horizontally along the ceiling for quite a distance, and shows little evidence of having been so long in use.

HEATING AND VENTILATING A RESIDENCE WITH HOT AIR FURNACE.

When so much is heard on every hand to the effect that furnace work is deteriorating owing to the seeming impossibility of getting people to pay for the best work, it will interest all in the trade to learn of cases where, in addition to paying for good work, the necessary outlay for a ventilating system has also been made. The need of ventilation with a hot air plant has been frequently pointed out, for it is difficult to get a sufficient flow of warm air into a room to secure a comfortable temperature when it is already full of air for which there is no escape. With this fact in view, the advantage of a system of ventilation in connection with a hot air furnace is so apparent that it would seem only necessary to thoroughly explain it to bring such a system into general use. It has always been a strong point for furnace heating that a building could not be heated by a furnace unless there was a continual inflow of fresh, warm air to maintain the desired temperature, and a corresponding leakage from the room of the air that was already in it—which is, in effect, ventilation. A proper system of vent flues will greatly aid this result and give a corresponding improvement in the quality of the atmosphere in the building in which it is used.

Through the courtesy of E. R. Rayburn, Columbus, Ohio, we are enabled to present plans and the following description of a heating and ventilating system designed by him and installed under his supervision in the residence of J. C. Munger, Xenia, Ohio. It has now been in operation two winters and has demonstrated its advantages to the satisfaction of all concerned. A plan of the basement is given in Fig. 1, showing the location of an all cast iron portable furnace of the circular radiator type, which has a 50-inch casing, a grate about 25 inches in diameter, and which exposes, by actual measurement, 52 square feet of heating surface in the fire pot, dome and flue section. The plan also shows the air supply, the heating pipes and the ventilating shaft, which is the feature of this plant. This shaft above the foundation is a single brick in thickness, with a brick laid across the corners to strengthen it. The bricks are laid in cement and the inside of the shaft is also smoothed with cement to reduce the friction.

The shaft is 20 x 24 inches in size, and owing to the 8-inch tile smoke stack running through it the effective area is reduced to about 417 square inches. The smoke stack is made of lap joint tile, put together with cement and tied to the brick shaft by 1 x ¼ inch iron braces, as shown in Fig. 2, which is a sectional elevation of the lower part of the shaft. The weight of the stack is supported on an elbow built solidly into the base and which serves as a clean out, the smoke pipe being connected into a tee joint, as shown. The products of combustion from the furnace passing through the stack warm the flue and induce an inflowing current of air from all the rooms on starting the fire. In order to prevent air from one room passing across the flue to another, tin boxes curved at the bottom and open at the top are placed in the shaft back of the registers, as shown in Fig. 2, to insure an upward passage of the air drawn from the rooms. The top of the ventilating shaft is covered by a galvanized sheet iron cap placed 8 inches above the brick work and fitted tightly around the tile so as to prevent water from coming in contact with the tiles where heated and causing them to crack.

Those rooms not adjacent to the shaft are connected with it by means of tin flues running up, from registers near the floor, in the partition to the attic and then over to the shaft. It will be seen on comparison that the ventilating shaft has an area equal to nearly three-fourths of the hot air inlets, and when it is considered that the air enters the rooms from the furnace at a temperature of about 150 degrees, more or less, and falls to a temperature of 70 degrees before leaving, the contraction in bulk will

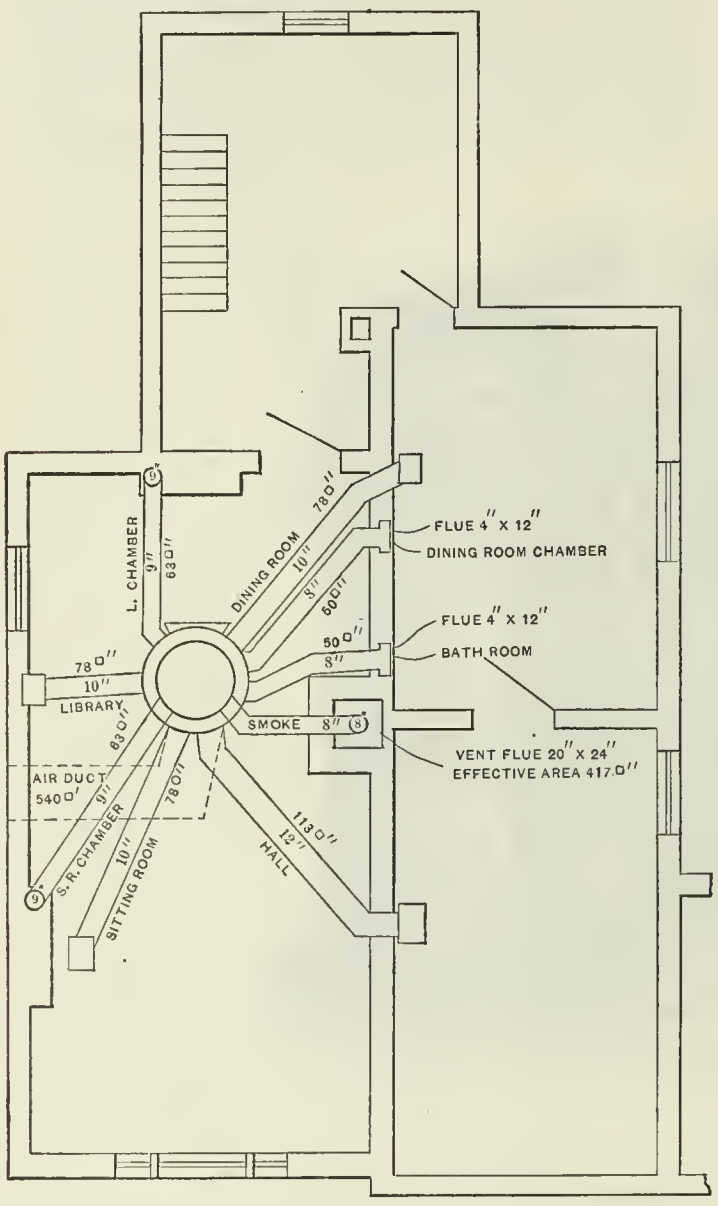


Fig. 1.—Plan of Cellar, Showing Furnace, Size and Area of Piping and Ventilating Shaft.

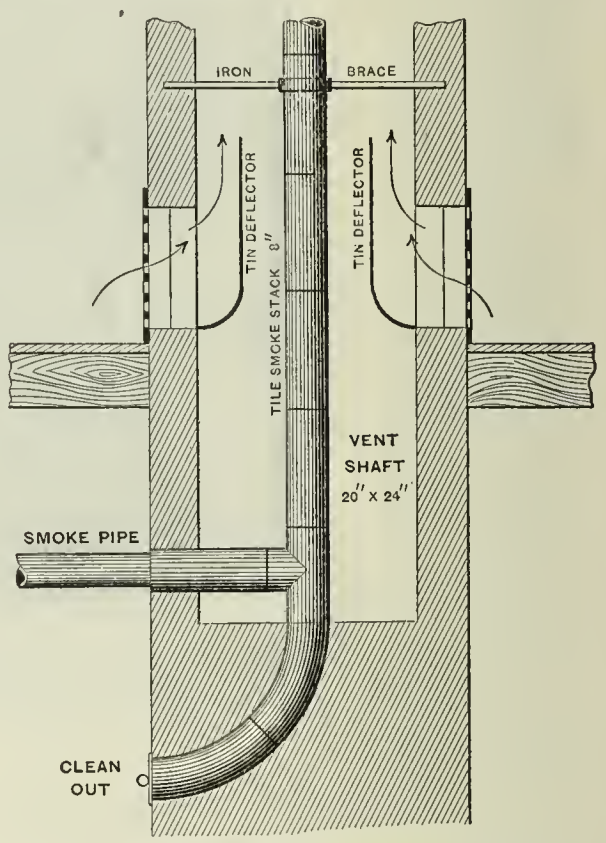


Fig. 2.—View of Ventilating Shaft, Showing Detail of Construction

HEATING AND VENTILATING A RESIDENCE WITH A HOT AIR FURNACE.

compensate for the seeming lack of capacity in the shaft. Mr. Rayburn, who does not claim this plan as a new idea, states that a practical test has demonstrated that the ventilation is thorough, and that therefore the heating is more positive, while the extra cost, considering the advantages, is small. He further says that he would urge upon any one thinking of putting in an apparatus on this plan the necessity of using a large heater and a plentiful air supply. It will be noticed from Fig. 1 that the air supply is 540 square inches in area and that the combined hot air outlets are 573 square inches in area—a much more liberal proportion than is generally provided. It will also

lent glass surface in square feet. That portion of the house which is directly heated contains about 12,374 cubic feet and bears a proportion of 21⅔ cubic feet of space to 1 square inch of area in the heating pipes. The wall surface exposed is about 2012, bearing a proportion of 3 5-10 square feet to 1 square inch, while the equivalent glass surface is 519 square feet and the proportion is 0.905 square foot to 1 square inch in the hot air pipe.

The correct grate area is given as 490 square inches, or about 3.4 square feet; and as there are 52 square feet of heating surface in the furnace the proportion is 1 square foot of grate to 15.3 square feet of heating surface. The

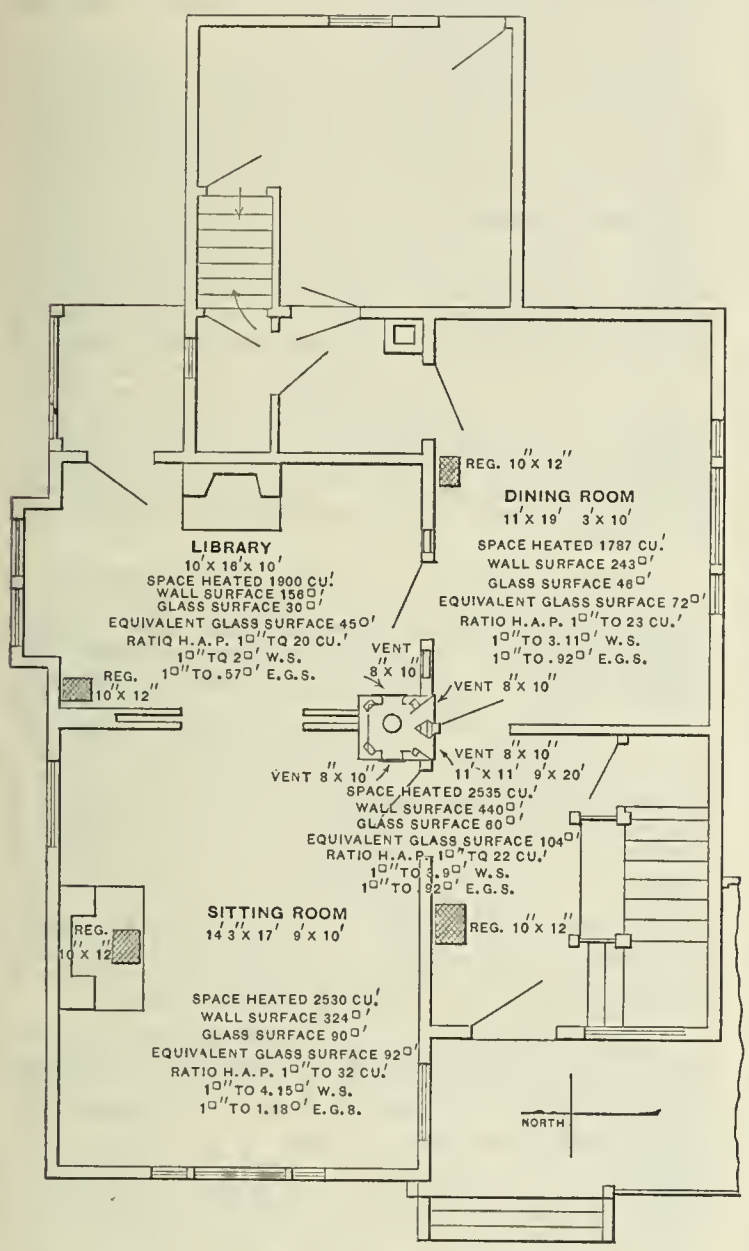

REG. 10" X 12"
DINING ROOM
11' X 19' 3' X 10'
SPACE HEATED 1787 CU.'
WALL SURFACE 243□'
GLASS SURFACE 46□'
EQUIVALENT GLASS SURFACE 72□'
RATIO H.A.P. 1□" TO 23 CU.'
1□" TO 3.11□' W.S.
1□" TO .92□' E.G.S.
LIBRARY
10' X 16' X 10'
SPACE HEATED 1900 CU.'
WALL SURFACE 156□'
GLASS SURFACE 30□'
EQUIVALENT GLASS SURFACE 45□'
RATIO H.A.P. 1□" TO 20 CU.'
1□" TO 2□' W.S.
1□" TO .57□' E.G.S.
REG. 10" X 12"
VENT 8" X 10"
VENT 8" X 10"
VENT 8" X 10"
VENT 8" X 10"
11' X 11' 9' X 20'
SPACE HEATED 2535 CU.'
WALL SURFACE 440□'
GLASS SURFACE 60□'
EQUIVALENT GLASS SURFACE 104□'
RATIO H.A.P. 1□" TO 22 CU.'
1□" TO 3.9□' W.S.
1□" TO .92□' E.G.S.
SITTING ROOM
14' 3" X 17' 9' X 10'
REG. 10" X 12"
REG. 10" X 12"
SPACE HEATED 2530 CU.'
WALL SURFACE 324□'
GLASS SURFACE 90□'
EQUIVALENT GLASS SURFACE 92□'
RATIO H.A.P. 1□" TO 32 CU.'
1□" TO 4.15□' W.S.
1□" TO 1.18□' E.G.S.
NORTH

Fig. 3.—Plan of First Floor, Giving Details of the Work to be Done and Provisions Made.

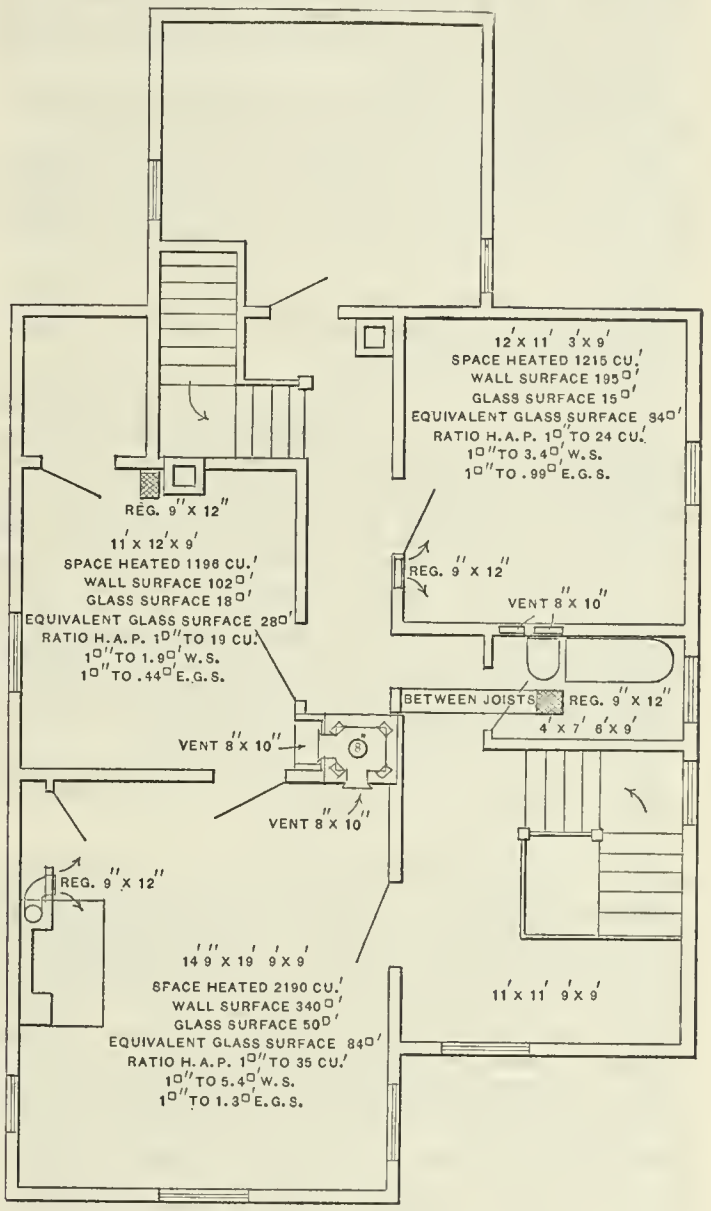

12' X 11' 3' X 9'
SPACE HEATED 1215 CU.'
WALL SURFACE 195□'
GLASS SURFACE 15□'
EQUIVALENT GLASS SURFACE 94□'
RATIO H.A.P. 1□" TO 24 CU.'
1□" TO 3.4□' W.S.
1□" TO .99□' E.G.S.
REG. 9" X 12"
11' X 12' X 9'
SPACE HEATED 1196 CU.'
WALL SURFACE 102□'
GLASS SURFACE 18□'
EQUIVALENT GLASS SURFACE 28□'
RATIO H.A.P. 1□" TO 19 CU.'
1□" TO 1.9□' W.S.
1□" TO .44□' E.G.S.
REG. 9" X 12"
VENT 8" X 10"
BETWEEN JOISTS
REG. 9" X 12"
4' X 7' 6' X 9'
VENT 8" X 10"
VENT 8" X 10"
REG. 9" X 12"
14' 9" X 19' 9' X 9'
SPACE HEATED 2190 CU.'
WALL SURFACE 340□'
GLASS SURFACE 50□'
EQUIVALENT GLASS SURFACE 84□'
RATIO H.A.P. 1□" TO 35 CU.'
1□" TO 5.4□' W.S.
1□" TO 1.3□' E.G.S.
11' X 11' 9' X 9'

Fig. 4.—Plan of Second Floor.

HEATING AND VENTILATING A RESIDENCE WITH A HOT AIR FURNACE.

be noticed that the pipes leading to the different rooms are generous in proportion to the space heated.

The plan of the first floor of the house is given in Fig. 3, which shows the location of the heating registers and how a ventilating register from each room is connected with the vent shaft. A plan of the second floor is given in Fig. 4, 9-inch round hot air stacks being used for heating the chambers over the library and sitting room and 4 x 12 stacks for heating the bathroom and adjoining chamber. These two rooms not being convenient to the stack, the vent flues run up in the partition and connect with the shaft as previously described. On the plans shown in Figs. 3 and 4 there is given for each room the capacity in cubic feet, the exposed wall surface, the glass surface, the equivalent of the glass surface, calculating that 10 square feet of wall will lose as much heat as 1 square foot of glass, and the ratio of 1 square inch of area in the hot air pipe to the cubic space, the wall surface and the equivaproportion of grate surface is 1 square inch to 25 cubic feet of space, 4.1 square feet of wall surface or 1.06 square feet of equivalent glass surface. The proportion of heating surface in the furnace is 1 square foot to 238 cubic feet of space, 39 square feet of wall surface or 10 square feet of equivalent glass surface.

The coal used is of the soft smokeless variety, and the amount consumed during a winter season is about 12 tons. The house is a well built frame construction, having felt and 1-inch pine sheathing. With the data given here more extensive comparisons can be made by those who desire to do so.

The Warren Steel Range Company of Warren, Ohio, are very busy at the present time filling orders, one of which calls for 500 Ranges. Manager Shook, according to a local paper, says that a continuance of the present demand will require an early enlargement of their manufacturing facilities.

ODD PLATES.

The Novelty Mfg. Company of Jackson, Mich., are distributing a handsome lithographed poster showing their Aluminum No. 3 Heating Stove. The poster is in colors and represents an interoir view, in which a little child in scanty attire stands beside the Stove, surrounded by numerous pets in the shape of dog, cat and kittens. The poster is bound at the top and bottom with metal strips and is provided with a metal loop for hanging it in a conspicuous place in the dealer's establishment.

The Indianapolis Stove Company of Indianapolis, Ind., have finished the work of moving into the buildings recently purchased by them, and are now ready for active operations. We understand that the plant is modern and thoroughly up to date in all particulars and has a capacity of 500 Stoves per week. About 125 men are employed and the outlook for fall and winter business is said to be good.

The title of the Sheffield Stove Works, Sheffield, Ala., has been changed to the Sheffield Stove Foundry.

W. B. Wilkinson, 210 Water street, New York, manager of the Howard Furnace Company's branch, is making an extended trip in New Jersey, Pennsylvania, Delaware and Maryland in the interests of the Howard Hot Air Furnaces.

George M. Clark of George M. Clark & Co., Chicago, Ill., manufacturers of Gas Ranges, was one of the visitors in New York City this week.

The Ringen Stove Company, St. Louis, have been experimenting for some months past with a process to enamel the fronts of their Quick Meal Steel Ranges, instead of painting them, and have finally succeeded in perfecting a process whereby they are enabled to do this. The great difficulty with enameling the fronts of Ranges has been that in riveting the Range the enamel would crack and peel off. By the process now adopted by the Ringen Stove Company the fronts are enameled and the rivets placed in position without any peeling or cracking whatever. The result is a smoother, blacker and glossier front than can be obtained by painting, and also a front that will stand very much greater heat. The rivets used by the Ringen Stove Company in their Quick Meal Range are nickel plated and the effect is very handsome.

The Standard Lighting Company, Cleveland, Ohio, report very large sales of their New Process Oil Heater, advertised in our columns this season.

We have received from the Standard Thermometer & Electric Company of Peabody, Mass., a circular of the Standard Oven Indicator. This is designed for use in the over doors of Stoves and Ranges. The dial is free from any marks which would convey an idea of temperature, it being claimed that when experimenting heat of the right degree for cooking any article of food is learned, and the hand on the indicator shows the mark. When cooking the same food again it is only necessary to get the oven to a temperature that will make the indicator reach the same mark, when it will be perfectly safe to put in the food for baking. By this means overdone or underdone baking is prevented, and instead of the cook rushing things into the oven as soon as they are ready, whether the over is ready or not, the indicator shows whether or not the oven is in a fit condition for use.

The Round Oak Stove Works, Dowagiac, Mich., have just installed one of the largest engines in that section. It is a 400 horse-power cross compound Reynolds-Corliss engine, built by the Edward P. Allis Company, Milwaukee. Steam is generated for it by new Babcock & Wilcox water tube boilers.

W. H. Switzer, president and general manager of the Superior Foundry Company, Little Falls, N. Y., manu facturers of Superior Furnaces, is now making a tour of the West, visiting the company's agencies and establishing a number of new ones. The past week was partly spent in Chicago. Mr. Switzer reports a very good business in progress. He finds a very much better feeling in the country trade and regards the prospects for the future as very encouraging.

William H. Whitehead, late of the Chicago & Erie Stove Company, and an ex-president of the National Association of Stove Manufacturers, was among the callers at our Chicago office last week.

Horton, Gilmore, McWilliams & Co., 172 to 176 Lake street, Chicago, are exhibiting a large line of samples of Cole's Air Tight Heater. No less than 14 sizes of this Heater are now made, and in five styles, comprising an assortment which is certainly designed to cover a very wide range of requirements. The largest sheet iron Stove for wood is 36 x 24 inches and 30 inches high. The largest cast top Stove for wood is 30 x 19 inches and 28 inches high. The largest coal Stove, however, is 24 inches in diameter of jacket and should be seen to be appreciated in the fullness of its girth. The demand for these Stoves has been very heavy this fall. The manufacturers report their sales likely to show an increase of 300 per cent. over those of last year.

Rathbone, Sard & Co. state that their stocks of Stoves have fallen so low and the demand is so good that they have been obliged to start up another foundry at Albany, N. Y. They now have two foundries at work there and one at Aurora, Ill., or three in all, which are turning out work as fast as it is possible for the men to get it in shape. On some patterns of Stoves they have fallen so far behind at Aurora that it is not uncommon for pieces to be mounted on the same day they are cast. The new base burners brought out this year have proved especially popular, but a good demand has been experienced for other Stoves of the Acorn brand.

C. W. Aldrich of Minneapolis, Minn., a traveling representative of the Mississippi Valley Stove Company, Fulton, Ill., has been granted a patent on a Heating Stove. It has a central or combustion chamber and top and bottom radiating chambers, with flues so arranged that the products of combustion first pass downward into the bottom radiator and, after completing the circuit, go upward to the top radiator, and after a passage completely around it pass out into the chimney flue. This course for the heat currents for the fire must lead to a thorough utilization of the heat generated by the fire, and thus economize fuel to a marked extent. Another important feature of Mr. Aldrich's new Heater is found in the fresh air intake. In this Heater there is a supply pipe of air circulating or heating tubes. Some of these tubes open below and above into the room, and certain ones of these are provided with independent means for drawing an air supply either from this intake or from the room We hope the Heater will prove a great success and bring friend Aldrich both fame and shekels.

The line of Gas Heaters and other gas appliances being put on the market by H. Adler, Tr., of 14 and 16 Wood street, Pittsburgh, Pa., are meeting with a heavy demand from the trade, and the volume of business done by Mr. Adler this fall is considerably in excess of any previous similar period. Among the goods for which there has been a particularly heavy demand are the Acme Gas Stoves for natural gas and the Lustre Gas Stoves for artificial or natural gas. These are made in 20 styles and sizes and possess many points of excellence. Mr. Adler is also meeting with a good demand for the Victor Natural Gas Burner, which he manufactures under a patent. A strong point claimed for this Burner is that it is constructed in such a manner that it will not light in the mixer, a feature that is sure to be appreciated by natural gas consumers. Mr. Adler issued some time since a very complete illustrative catalogue of his goods which he will be pleased to send to any address upon application.

A sensational suit, claiming $25,000 damages, has been filed in the Superior Court at Chicago, says the Chicago *Evening Post* for October 12, by A. C. Selleck, a wholesale hardware dealer on West Madison street, against the Northwestern Stove Repair Company, R. L. Greenlee, their president, and R. S. Greenlee, their vice-president and treasurer, T. C. Cunningham, R. Robinson & Sons, J. L. Morris, Michael Brucker, W. S. Cumming and the Manufacturers' Stove Repair Company. All of the defendants are manufacturers or jobbers in Stove Repairs. The plaintiff claims that the defendants formed an association for the purpose of controlling prices, which he refused to enter, and that in consequence he has been forced out of business through his inability to obtain goods.

An interesting series of business conventions began on Monday in New York City under the auspices of the New York Board of Trade and Transportation. The object of these conventions is to promote discussion of important public questions of the time, with the view to benefit general trade. A number of subjects have been selected for presentation by well-known persons, the list of topics including such subjects as " A United States Department of Commerce," " A United States Department of Health," and so forth. The conventions will extend over a period of three weeks, and are expected to be attended by a number of out of town visitors.

A special dispatch from Paris, France, says that the French steamship line, the Compagnie Générale Transatlantique, will shortly construct a new fleet of steam vessels for passenger and freight service between Havre and New York, the average speed of the steamers being not less than 22 knots per hour.

Major Moses P. Handy, special United States Commissioner to the Paris Exposition of 1900, reports that he has secured 25 per cent. additional space for the American exhibit, making the space allotted to the United States equal to that of the other great nations of the world.

THE AMERICAN INSTITUTE FAIR.

The sixty-ninth fair of the American Institute opened at the Madison Square Garden, New York City, on September 20, and will close on November 3. In addition to the exhibits of interest to the trade, the fair has band concerts, flower shows and other special features to attract the sightseer. One feature of this fair is an extensive exhibit of food products. These are arranged around the gallery, while the machinery exhibit is in the basement of the garden, and the main floor is devoted to industrial exhibits.

THE COLUMBIA NOVELTY COMPANY

of 147 Center street, New York, exhibited a specialty which they call the "Two-in-One" salt and pepper shaker. It is made of glass with a metal top with a partition down the center, so arranged that either can be used at will without the other, or both in combination when desired.

THE NEW YORK ROLL WRAPPING PAPER COMPANY

of 440 Pearl street, New York, showed racks for the support, either under a shelf or on a counter, of rolls of paper of various widths for the use of the storekeeper in wrapping up bundles. They also exhibit the Simplex twine holder.

HARMS & KUPFER

of 68 Trinity Place, New York, made an exhibit of the Johnson patented pipe wrench, which is made of high grade material and consists of but two pieces, so arranged that it is adjustable to various sizes of pipe, and is said to do good work without any tendency to crush.

THE J. M. GUNST DISINFECTING COMPANY

of New York displayed in an attractive style cases of their Phenoleum disinfectant, which is designed for use in water closets, urinals or any other place where a disinfectant may be required.

THE BRASS FOUNDRY SUPPLY COMPANY

of 28 Prospect street, Newark, N. J., made a display of their newly patented brass molders' flask, so constructed that the ribs used for strengthening do not interfere with ramming and prevent shifting.

THE DIMOCK & FINK COMPANY

of 220 East 125th street, New York City, exhibited C. H. Moore's patent water closet floor connection, attached to their Apex siphon jet water closet. The device is said to supply a perfect joint in what is generally recognized as the weakest point in the house drainage system—that is, the connection between the earthenware and the drainage pipe. This connection consists of a brass fitting which is imbedded in the earthenware of the closet, and arranged to be screwed directly into another brass fitting, which is soldered tight into the lead bend under the closet.

THE BISSELL CARPET SWEEPER COMPANY

of Grand Rapids, Mich., made an exhibit, in charge of their New York house. at 103 Chambers street, showing the various styles of the Bissell and their Cyco Bearing, Grand and Crown Jewel carpet sweepers.

THE KNIGHT ASBESTOS COMPANY,

Times Building, New York, made an extensive display of their water filtering and cooling fixtures. They showed water drawn direct from the hydrant service in a white enameled bathtub, and the same water in another tub after it had passed through their filtering device, showing a marked difference in the clearance of the water.

THE AMERICAN INCANDESCENT LAMP COMPANY

of 205 East Seventy-sixth street, New York City, had an extensive display of incandescent lamps, globes and fixtures for gas lighting. Their lamp consumes gas through a Bunsen burner, the heat from which is used for heating a fire proof mantel to a white heat, from which the light is secured.

THE NEW JERSEY WIRE CLOTH COMPANY

of Trenton, N. J., made an exhibit of the Roebling standard fire proof wire lathing and the methods of applying it to buildings.

THE A. A. GRIFFING IRON COMPANY

made a fine display of their house heating boilers and various styles of radiators, and also of their steam specialties for various purposes. The Bundy gravity pump and tank trap were shown in operation, using compressed air instead of steam. Steam separators, grease extractors, the Hydrox pot trap and exhaust heads were other features of the exhibit. The company had a complete line of attractive circulars for each of their specialties, showing the construction by broken views and giving explanations of their operation.

THE GORDON-BURNHAM BATTERY COMPANY

of 82 West Broadway, New York, had a display showing the various uses to which the Gordon primary cell can be put in ordinary electrical work. It is pointed out that the cell is absolutely non-freezing and is not consumed by local action when not in service.

THE AMERICAN GAS FURNACE COMPANY,

New York, combined two exhibits in one, one devoted to the American oil gas engine and the other to gas blast furnaces, forges and heating machines for brazing and mechanical purposes, and also fire pots for plumbers and tinners.

THE IRON CLAD MFG. COMPANY

displayed the improved Iron Clad gas water heater, a specially constructed boiler which can be used in connection with the ordinary kitchen range and also heated economically by means of a gas burner, automatically controlled, placed beneath it.

THE THATCHER FURNACE COMPANY

of 240 Water street, New York, showed one of their latest style Thatcher ranges, which is made with either right or left hand oven, for use with either horizontal or vertical boilers and with all modern improvements.

BEHRER & CO.

of 69 Centre street, New York, exhibited the sanitary earthenware manufactured by the Charles Graham Chemical Pottery Company of Brooklyn, N. Y. The roll rim kitchen sink with an earthenware back from which the faucets extended, and supported by substantial legs, attracted much attention.

THE BECKFIELD WATER HEATER COMPANY

of Pittsburgh, Pa., showed their Monarch water heater. This heater is made in various sizes and is designed for supplying all the hot water required either in a residence or an apartment house. It uses gas for fuel, the gas supply being under automatic control. The exhibit was in charge of Charles M. Woolcott, 1298 Broadway, New York.

CHARLES A. BENTZEN

of 240 West Twelfth street, New York, exhibited the A B C washer, a machine designed for domestic laundry work, so arranged that a triple action is secured when in operation, affording motion very similar to hand rubbing.

GEORGE L. CUMMINGS

of 208 West Seventy-first street, New York, showed the Cummings water filter, an apparatus designed for purifying the water used in dwellings, hotels or apartment houses. It is arranged to be attached to the service supply and purify all the water that is used in the building. This system is said to be in use in the Hotel Waldorf, where, it is claimed, 1,000,000 gallons of water are purified in a week.

GEORGE M. CLARK & CO.

of Chicago, Ill., made an exhibit of their Jewel gas stoves, ranges and radiators under the charge of Frank C. Blaisdell, their Eastern agent. They gave out handsome chromo-lithographed cards and a little pamphlet showing their various heating stoves and photogravures of handsome apartments in which they are used for heating.

THE GILBERT & BARKER MFG. COMPANY

of 82 John street, New York, made an exhibit of Clarke's automatic instantaneous water heater. This heater is designed to be connected with the hot water service system of a house either in connection with or independent of the kitchen range boiler. The construction is such that on opening a hot water faucet in any part of the dwelling the flow of water through the service pipe opens the valve connected with the gas supply and the water passes through a coil presenting a large amount of surface in copper pipe, against which the flames play, so that the water is heated as fast as it flows.

TRADE REPORT.

METAL MARKET.

Pig Tin.—A fairly large business has been effected, chiefly in moderate sized lots such as consumers usually require for current use or to keep their stocks in good working shape. Without the aid of speculation here wholesale prices have gradually hardened, and the market at this writing shows decidedly firm tone. Jobbers' prices are firm at 14¾c. per lb. for Straits Pig in small lots from store.

Copper.—There has been somewhat freer offering from several quarters and the market is slightly weaker in tone, without, however, other than very moderate fluctuation in prices. Exports have not been up to the late average and the European demand has moderated somewhat. The market, as a whole, remains in much the same condition as it was a week ago. Small lots of Lake Ingot from stock are quoted at 12¼c. per lb. and Ansonia Grade Casting Copper at 11¼c.

Sheet Copper.—No decided change for the better or for the worse is noted in this department. Sales are of fair proportions and probably fully equal to the average volume for the season. Prices are stiffening and manufacturers are unwilling to book orders for deliveries extending beyond the end of this year. For spot and early delivery the ruling quotation for Sheet Copper in retail lots is at about 15c. per lb., basis.

Pig Lead.—The market has been unsettled and rather weak, owing to some selling pressure here and in the West, together with more or less "bearish" effort of some operators. The consumptive demand is tame, large buyers seemingly having filled their future requirements for some time ahead. In a retail way business was only moderate, and jobbers' prices for small lots were put down about ⅛c. a pound, American Pig ruling at 4½c. to 4⅝c. per lb.

St. Louis advices are as follows: The market has continued to ease off and very little trading is being done.

Lead Pipe and Sheet.—The demand for these materials has shown little spirit. Orders were largely of a hand to mouth cahracter and made up a meager total. No marked increase in the demand is looked for before the spring. On the whole, the season's trade has been disappointing to the manufacturers and dealers, but they look forward hopefully to great improvement after the turn of the year. Eastern dealers quote 6¼c. per lb. for Pipe and 7¼c. per lb. for Sheet, subject to a discount of 20 per cent.

Spelter.—Moderate sales only have been reported here, and the Eastern demand generally is tame, with larger lots than a few carloads seldom involved. Prices are rather weak and the offerings more liberal. Galvanizers and Brass manufacturers seem to bc well supplied for operations ahead in contracts placed last month. Quotations for retail lots are unchanged, 4¾c. per lb. for good Western brands being the outside price asked by jobbers.

St. Louis advices indicate no change in Spelter at that center. The demand is moderately heavy and prices remain unchanged.

Antimony.—The market has been quiet but steady at about 8¼c. to 8½c. for Cookson's, 7¾c. to 8c. for Hallett's and 7¼c. to 7½c. for Japanese.

Nickel.—Prices remain steady at about 38c. per lb. for small lots.

Aluminum.—A reduction of 2 to 3 cents a pound in the price of Aluminum Ingots has been made by the Pittsburgh Reduction Company in their October list. Present prices are as follows: No 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb., 100 lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb., 100 lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb., 100 lb. lots, 30c. Scrap Aluminum is quoted at 30c. per lb., f.o.b. works at New Kensington, Pa.

Tin Plate.—Orders for American Plates have been running light during the week. Selling competition, on the other hand, shows more sign of life, and prices are, if anything, a shade weaker. Deliveries on contracts are still much delayed, however, and spot orders are difficult to place. The scarcity of Steel continues, and mills in many cases are considerably hampered in their operations. A falling off is noted in the demand for Cokes. The canning season is virtually over, and little or nothing in the way of orders comes from that source, while Tinware makers and other users of Bright Plates seem backward in buying. Most of the larger consumers have probably placed their contracts for supplies well ahead, and are taking no interest in the current market. Other buyers are thought to be holding off in the expectation of lower prices. Roofing Plates have been a particularly disappointing article this season. Various reasons are given for the restricted demand for these Plates. Some attribute it to slackness in the building trade. Others to the increasing use of shingles and other coverings in buildings where Terne Plates were formerly used. Whatever the cause, it is certain that a much smaller quantity of Tin roofing has been used this year than formerly. The retail trade has been fairly active. No sign points to any early advance in prices, notwithstanding the advancing tendency in Steel and the comparatively light stock of available Plates at the mills and in second hands. Something of a sensation was caused in the trade this week by the news of several large new Tin Plate plants being likely to be built, which would inflate very materially the capacity of the American industry. It is felt, however, that even if all the projected plans are carried out it will be many moths before they will be able to make any sensible impression on the market. Jobbers' prices show no noteworthy change. Quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3 40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn grade, IC, 14 x 20, $4.55; Allaway grade, IC, 14 x 20, $4.15; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are in light demand, and prices are more or less nominal.

Chicago advices are as follows: This branch of trade is perverse, prices being weak when they should be strong. Ternes are particularly heavy, especially the cheapest grades. The advancing prices of Steel must soon have a bracing effect on this as well as other finished products.

A special London cable dispatch of October 13, 1897, reports on the British Tin Plate market as follows: Tin Plates are weaker, owing to workmen acceding to masters' terms. Business has been chiefly in odd sized oil sizes. Stocks at Swansea, 82,678 boxes. Ordinary Cokes sold at 9s. 6d. at Swansea.

Sheet Iron.—The demand for Black Sheets is referred to as quite active. Mills are somewhat hampered by the difficulty in obtaining supplies of Bars, and both Black and Galvanized Sheets for prompt delivery are hard to obtain. Prices are decidedly firmer since the meeting of Sheet manufacturers in Pittsburgh last week, when an advance was made, which is expected to be sustained So far their action has not affected jobbers' prices in this vicinity, however. These are unchanged from the rates reported for the past few weeks—namely, 2.35c. to 2.40c. per lb. for No. 27 Common Black Iron, 2 65c. to 2.70c. for No. 27 R. G. cleaned and 75 and 10 and 5 per cent. off the list for Galvanized Iron.

Chicago advices are as follows: Prices are maintained by all manufacturers on the basis of the recent advance. Inquiries are being received, but few mills are found able to consider deliveries earlier than five or six weeks. Inquiries are now accompanied by specifications, showing that the material is absolutely needed. Small lots from stock are selling at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—Only a moderate business is reported, with no quotable change in prices. Dealers are paying about the following prices for New York City delivery:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¼c.
Light Brass	per lb. 4¼c.
Lead	per lb. 3¼c.
Tea Lead	per lb. 2¾c.
Zinc	per lb. 2 c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4¼c.
Wrought Scrap Iron, per gross ton	$10.00 to $10.50
Heavy Cast Scrap, per gross ton	$9.00 to 9.50
Stove Plate Scrap, per gross ton	5.50
Burnt Iron, per gross ton	4.50

THE IRON MARKET.

The monthly Pig Iron statistics published by *The Iron Age* furnish eloquent proof of the expansion in the demand for Iron during the past few months. From a weekly product of 165,000 tons on August 1 the capacity at work has risen to 200,000 tons, and yet stocks have declined over 200,000 tons, of which by far the greatest quantity was absorbed during September. It is quite clear, therefore, that consumption lately has expanded even more than production, so that there is nothing alarming in the known fact that additional furnaces are getting ready. As a matter of fact, nearly every well equipped furnace in the territory west of the Alleghany Mountains and north of the Ohio River will be running by November 1. That means that nothing more is to be expected in the way of expansion from that section.

The South is in a position to produce more heavily, so far as furnace equipment is concerned, but it will not be quite so easy to provide the necessary fuel and Ore.

The East, of course, has many plants idle, and a considerable number are in shape to start operations. A good many stacks are carried along in the lists because they have not been actually dismantled. They might as well be in the South Sea Islands so far as their ability to make Iron at a profit is concerned. We do not believe that the real live capacity in the country is much above 225,000 or 230,000 tons a week. We are not likely to reach the necessity for such a total, with the winter before us, and the usual slackening of consumption during that season.

There is, therefore, no occasion for anxiety, but it must be conceded, too, that we have not got any extraordinary amount of reliable reserve.

From the Central West come reports of a continuance of the scarcity of Steel for early delivery, thus confirming the evidence furnished by the reports from the furnaces. The majority of the Steel works are full of orders until well toward the end of the year. This would seem to justify the conclusion that we are not to witness the usual winter scramble for work as early as usual, if, in fact, it does come at all.

The Wire trade maintains unusual activity, if the demand for Wire Rods for early delivery be a criterion of the condition of the business. One firm of merchants have sold about 15,000 tons of Rods during the week.

Prices along the whole line of Rolling Mill products are steady, and advances where made are being well maintained.

Pig Iron.—The New York market has been quiet and steady. It is certain that there is more Iron being melted, but founders generally complain that there has been no upward tendency in their products so far, and that from their point of view there is nothing to justify higher prices for metal. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $11 to $11.25; No. 2, $10.50 to $10.75; No 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

Philadelphia advices are as follows: Buyers could be found for almost any quantity of Iron at a little below the asking prices, but sellers are not numerous even at their own figures. Shipments are called for with such urgency that makers feel very different to what they did when requests for postponements were almost of daily occurrence. There is everything in the situation to stimulate confidence and nothing to indicate an overbought market, so that it is no wonder that prices are firm. It would be very difficult to get any kind of Pig Iron at $10.25: not much Plain No. 2 could be had at $10.75, or No. 2 X at $11.25. These are certainly minimum figures; 50c. to 75c. more is very frequently quoted, and if the Iron is not taken at these or pretty near to these figures holders are satisfied to keep their Iron. General quotations for seaboard deliveries are about as follows, with the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.50; No. 2 X Foundry, $11.25 to $11.75; No. 2 Plain, $10.75 to $11.

In the Chicago Pig Iron market, the local producers continue to take the lion's share of the current business. They report an excellent trade in lots running up to 500 tons for general consumers. The demand has been heavier for special grades. The Southern sales agents report a satisfactory week, the leading companies having their outputs so well sold that they are not in a position to take much business for delivery the remainder of this year. It is expected that freight rates from the South may be advanced in the near future and that prices are therefore at present as low as can be made for a long time to come. Not much is doing in Lake Superior Charcoal. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to	$13.00
Local Coke Foundry, No. 1	11.50 to	12.00
Local Coke Foundry, No. 2	11.00 to	11.50
Local Coke Foundry, No. 3	10.50 to	10.75
Local Scotch, No. 1	11.50 to	12.25
Ohio Strong Softeners, No. 1	12.00 to	12.25
Southern Silvery	11.25 to	11.50
Southern Coke, No. 1	11.00 to	11.25
Southern Coke, No. 2	10.60 to	11.00
Southern Coke, No. 3	10.35 to	10.60
Southern, No. 1 Soft	11.00 to	11.25
Southern, No. 2 Soft	10.60 to	11.00

Prices on Bessemer Pig in the Pittsburgh district are firmer. Foundry Irons are quiet. We quote as follows, f.o.b. cars Pittsburgh district: No. 1 Foundry, $10.50 to $10.75; No. 2 Foundry, $10 to $10.25; No. 3, $9.50 to $9.75; Bessemer, $10.50 to $10.65.

The general condition of the Pig Iron trade in the Cincinnati district is one which is causing a feeling of very great satisfaction. The tonnage of new orders booked during the past week has been moderate and made up mainly of lots ranging downward from 500 tons, with but few placed for the maximum amount. Deliveries would be all that could possibly be asked for by the most exacting factor were it not for a continuance of the car famine in Southern railroad circles. Purchasers are anticipating their contracts in taking Iron, and this leads to the belief that many who were considered out of the market for from four to six months yet to come will again appear as buyers considerably before the expiration of that time. Perhaps most of the Southern furnace interests are now getting outside quotations on the majority of their grades, but Iron can still be bought at the inside figures from several furnaces which have not well filled order books. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to	.....
Southern Coke, No. 2	9.50 to	$9.75
Southern Coke, No. 3	9.00 to	9.50
Southern Coke, No. 1 Soft	9.75 to	10.00
Southern Coke, No. 2 Soft	9.50 to	9.75
Southern Coke, Gray Forge	9.00 to	9.25
Southern Coke, Mottled	9.00 to	.....
Ohio Silvery, No. 1	12.75 to	13.00
Ohio Silvery, No. 2	12.00 to	12.25
Lake Superior Coke, No. 1	11.00 to	11.50
Lake Superior Coke, No. 2	10.50 to	11.00
Tennessee Charcoal, No. 1	13.00 to	13.25
Tennessee Charcoal, No. 2	11.50 to	12.00

The St. Louis market shows no particular change. There continues to be a scarcity of No. 2 Foundry and No. 2 Soft, and full prices are readily obtainable for these grades. The consumption of Pig Iron is very heavy and sales indicate that a continuance of the present activity among manufacturers is confidently anticipated. Consumers are in the market for delivery during the early part of next year, but sellers ask higher prices for such deliveries than consumers are at present willing to name. Some difficulty is experienced in having specifications filled promptly, as furnaces have pretty much all they can handle. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.75 to	$11.00
Southern, No. 2 Foundry	10.25 to	10.50
Southern, No. 3 Foundry	9.75 to	10.00
No. 1 Soft	10.75 to	11.00
No. 2 Soft	10.25 to	10.50

CHICAGO REPORT.

Scrap.—Old material is being sold as fast as it can be obtained from sources of supply. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$8.50	....
Machinery Cast	7.00	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	4.50	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c.	2.50	....
Old Boilers—whole (Iron)	3.00	....
Old Boilers (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas Pipe and Boiler Tubes	5 00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	9 00	....
Copper Wire and Heavy	....	10 c.
Copper Bottoms	....	9 c.
Copper Clips	....	9¾c.
Red Brass	....	8 c.
Yellow Brass	....	7 c.
Light Brass	....	4¼c.
Pipe Lead	....	3¾c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	½c.

Anthracite.—Business is dull. The price on carload lots of 12 tons minimum is now as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill.	$5.35	$5.60
Milwaukee, Wis.	5.35	5.60
Kansas City, Mo.	7.35	7 60
Council Bluffs, Iowa	7.35	7 60
Lincoln, Neb.	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak.	8.60	8.85

Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

Trade is moving along in good volume with orders coming largely from the retail trade. In this business the jobbers are getting their full share. There is also a good and pretty steady demand upon the manufacturers, coming from jobbers who need to replenish their stocks or from the larger retailers who buy in sufficient quantities to justify direct dealings with the producers of goods. The tone of the market continues good. The advances which have been made in heavy goods are generally firmly maintained, and there are indications that in other lines manufacturers are watching the situation closely with a view to announcing advances in their goods in case circumstances are favorable. It is recognized, however, that it is unwise to make advances that it may not be feasible to maintain, and manufacturers are disposed to move conservatively in this regard. Reports concerning the business situation throughout the country are decidedly encouraging, and the trade anticipate much better conditions than have prevailed for several years.

Advices from Chicago.—Shelf Hardware jobbers report a good volume of business all this month, notwithstanding the prevalence of the drought, which was so happily broken by the general rains early this week. They felt the influence of the dry weather in some sections in some classes of goods, but present a very cheerful view of the situation by stating that the demand would simply have been much heavier if the country had had its usual rainfall. The condition of the Hardware trade is therefore described as being very much better than would have been expected for the conditions prevailing. The demand, in fact, began to show indications of increasing last week before the rain came. The outlook is now in favor of very much better trade, especially in view of the fact that colder weather is setting in in the Northwest and is expected to extend to other parts of the country. Indications point to quite an advance in Screws, Strap and T Hinges, Bright Wire Goods, &c., owing to the much higher prices now prevailing on the raw materials from which they are made. Very low prices have prevailed for a long time, but the period of exceeding cheapness is now fast coming to an end.

Advices from St. Louis.—The Hardware jobbing trade are feeling much encouraged as the result of liberal rains to which the West and Central West have been treated during the past few days. The situation in many parts of this section was rapidly becoming alarming, and if the rain had been much longer delayed serious results would surely have ensued. The large manufacturers of Screen Door Hinges have disposed of their entire output, and an advance of at least 50 per cent. has been made over the prices ruling on these goods last year. The demand for Tire Bolts and Stove Bolts is very heavy, and the better grades of Builders' Hardware are selling very freely. The demand for Lamp Goods is phenomenal, and the same can be said of Boys' Iron Wagons and Sleds. The continued summer weather has curtailed the demand for cold weather goods to some extent, and the spread of yellow fever in the South has practically shut off the demand for all kinds of Hardware from the infected districts. A number of Texas points are quarantined and other points are in danger of similar treatment. Taking everything into consideration, however, the situation is fairly satisfactory. Collections are in excellent shape.

NOTES ON PRICES.

Wire Nails.—The condition of the market so far as Wire Nails are concerned is substantially the same as at our last review. There continues to be a steady demand on the manufacturers, and it appears to absorb promptly their output, most of the mills, in fact, being behind their orders. The trade are not, however, purchasing in a speculative way and the orders which are being placed are for the most part for lots of medium size. New York quotations are about $1.70 for small lots from store.

Advices from Chicago.—It will be surprising if a sharp advance does not shortly take place in Wire Nails and other Wire products, on account of the scarcity now prevailing in Wire Rods. The largest Wire Nail manufacturers report their facilities crowded to the utmost to meet the demand for Nails. They are almost without exception only quoting for delivery during the month and will not sell for the future, because they cannot tell what the cost of Rods may be. Prices therefore are firm at $1 60 to $1.65 for small lots from stock.

Advices from St. Louis.—The demand for Wire Nails is only fair. Manufacturers are not anxious to sell for delivery beyond the present month. Jobbers report a fair trade at $1.65 base.

Sheet Aluminum.—A radical reduction in the price of Plate and Sheet Aluminum is announced by the Pittsburgh Reduction Company, Pittsburgh, Pa., in their October price-list, just published. A rearrangement of the gauges is also made in the new list, which is as follows :

Plate and Sheet Price List.—B. & S. Gauge.

Prices are for 50 pounds or more at a time. Less quantities, 5 cents per pound additional. Charges made for boxing.

	In coils.	6-in.*	14-in.	16-in.	18-in.	20-in.	24-in.	30-in.	36-in.	41-in.	46-in.	51-in.	56-in.	Polishing one side.	Satin finish without lacquer. One side.
Wider than	2-in.	14-in.	16-in.	18-in.	20-in.	24-in.	30-in.	36-in.	40-in.	45-in.	50-in.	55-in.	60-in.		
And including	12-in.														
Nos. 13 and heavier	....	$0.40	$0.40	$0.40	$0.40	$0.40	$0.43	$0.43	$0.43	$0.44	$0.44	$0.45	$0.46	$0.02	$0.06
14	....	.40	.40	.40	.40	.40	.43	.43	.43	.44	.44	.45	.46	.02	.06
15	....	.40	.40	.40	.40	.40	.43	.43	.43	.44	.44	.45	.46	.02	.07
16	....	.40	.40	.40	.40	.40	.43	.43	.43	.44	.44	.45	.46	.02	.08
17	....	.40	.40	.40	.40	.40	.43	.43	.43	.44	.44	.45	.46	.03	.09
18	....	.40	.40	.40	.40	.40	.43	.43	.46	.47	.47	.50	.53	.03	.10
19	....	.40	.40	.40	.40	.40	.43	.44	.47	.48	.48	.52	.55	.04	.11
20	$0.38	.40	.40	.40	.40	.42	.45	.46	.48	.49	.49	.54	.57	.04	.12
21	.38	.42	.42	.42	.42	.44	.47	.48	.54	.55	.58	.61	....	.05	.14
22	.38	.42	.42	.42	.44	.44	.47	.51	.55	.57	.60	....	....	.05	.16
23	.38	.42	.42	.42	.44	.44	.47	.53	.56	.60	....	....	....	.06	.18
24	.38	.42	.44	.46	.46	.46	.49	.55	.58	....	....	....	....	.06	.20
25	.40	.43	.45	.47	.47	.47	.50	.57	....	....	....	....	....	.07	.23
26	.40	.43	.46	.50	.50	.50	.55	....	....	....	....	....	....	.08	.25
27	.40	.44	.48	52	.52	.53	.58	....	....	....	....	....	....	.10	.28
28	.40	.44	.50	.52	.53	.53	.60	....	....	....	....	....	....	.11	.32
29	.42	.45	.52	.54	.56	.56	.65	....	....	....	....	....	....	.13	.36
30	.42	.46	.54	.56	.60	.66	.73	....	....	....	....	....	....	.15	.40
31 and 32	1.35	....	....	....	....	....	....	....	....	....	....	....	....	....	....
33 and 34	1.55	....	....	....	....	....	....	....	....	....	....	....	....	....	....
35 and 36	1.85	Not	....	....	....	....	....	....	....	....	....	....	....	....	....
37 and 38	2.15	wider	....	....	....	....	....	....	....	....	....	....	....	....	....
39 and 40	2.40	than	....	....	....	....	....	....	....	....	....	....	....	....	....
0.003 to 0.0015-inch	2.60	6-	....	....	....	....	....	....	....	....	....	....	....	....	....
Less than 0.0015-inch	2.90	inch.	....	....	....	....	....	....	....	....	....	....	....	....	....

* All columns except the first are for Flat Rolled Sheets.

Discounts as follows are given for orders over 200 pounds :

200 to 1,000 pounds..... 10 per cent. off list
1,000 to 2,000 pounds, ordered in one month..10 and 2 per cent. off list
2,000 to 4,000 pounds, ordered in one month..10 and 3 per cent. off list
4,000 pounds and over, ordered in one month..10 and 5 per cent. off list

Sheets polished or satin finished on both sides, double the price for one side.

Cutting to lengths.—Up to 20 gauge, 1 cent per pound.
From 21 to 30 gauge, 2 cents per pound.

Cut Nails.—There continues to be a fair movement in Cut Nails and the market, both East and West, is in much better condition than a few months ago. The New York price is $1.53 in less than carload lots.

Advices from Chicago.—Stocks in Cut Nails are small, only two houses in this city now carrying anything like an assortment. The other jobbers carry no stock, but draw on these when they have an occasional order. Prices of small lots are somewhat uncertain under the circumstances, but usually range a little under Wire Nails, or $1.55 to $1.60.

Advices from St. Louis.—The market for Cut Nails is in good shape, and mills report steady sales. Jobbers quote $1.45 base for small lots from store.

Barb Wire.—The Barb Wire market has a firm tone and the demand is fair. Quotations continue unchanged.

Advices from Chicago.—The Rod situation, as given under the head of Wire Nails, applies with equal force to Barb Wire. The movement from factories grows heavier from week to week and buyers are now pushing for more prompt deliveries on contracts. The outlook is decidedly in favor of higher prices, but for the present quotations are maintained at $1.60 to $1.65 for Painted, and $1.90 to $1.95 for Galvanized, in small lots from stock.

Advices from St. Louis.—There is no change to note in this department. The demand is only fair. Jobbers ask $1.65 for small lots of Painted from store, with the usual advance for Galvanized.

Smooth Wire.—There have been no special developments in the market during the past week. There continues to be a steady demand, and Smooth Wire is apparently taking a more prominent place in the market than heretofore.

Poultry Netting.—There is no very important change to report in the market for Poultry Netting, and the indications are that the prices for next season will not be materially different from those which prevailed during the past season. It is understood that some of the manufacturers will put on the market a line of competition Poultry Netting, which will be in some respects different from the standard and will command a slightly lower price.

Glass.—The Glass manufacturers have been holding preliminary meetings at Columbus, Ohio, during the past week, the object of which has been the reorganization of the Glass associations and the formation of an American Glass Company. It is understood that the plans will probably be successfully carried out. As it is so late in the year and stocks in manufacturers' hands are much depleted, it is probable that whether or not the American Glass Company, or a single association of some form, are the outcome of the negotiations, some action will be taken by the manufacturers to arrange for the starting of the Glass factories in the near future. The new price-list of French Glass, which went into effect on October 1, is subject to a discount of 80 and 20 per cent., instead of 85 per cent. as stated in our issue of last week. The new list is not, however, used by all New York jobbers. The local market is weak, caused by light demand, and while the agreed price at which American Glass is to be sold is 60 and 10 and 5 per cent. discount, orders have been accepted as low as 60 and 20 per cent. discount.

White Lead.—There is no new feature in the market. Buyers have purchased in the ordinary way, taking about what they usually do at this season of the year, while sellers generally were accommodating in filling orders at old prices. Nothing in the way of distinctly new feature has come to the surface. Both Pig Lead and Linseed Oil have ruled rather weak, but not enough so to cause any break in either Dry or Oil Leads for spot or future delivery.

Red Lead.—Both domestic and foreign product have remained very steady in price, but nothing more than ordinary business has been effected in either, and buyers are at present operating in very ordinary way.

Linseed Oil.—The market has been more settled and may fairly be quoted steady, at prices within the line of 34 to 35 cents for city brands of raw and 33 cents for Western. This slight improvement is attributed chiefly to steadier market for raw material, there having been merely ordinary business in the products.

Spirits Turpentine.—Prices have moved steadily upward under the influence of moderate offering here and strong advices from the South. Up to 34½ to 35 cents has been paid for good sized lots.

The plant of the St. Louis Smelting & Refining Company, St. Louis, Mo., is about to be put in operation again after four years of idleness. Missouri lead ores will be treated.

It is rumored that the Pittsburgh Reduction Company are about to close their branch office in New York City and transfer their Eastern selling agency to a local jobbing house.

Official figures show that the production of gold in Australia during the first six months of 1897 was 1,050,644 ounces, an increase of 183,022 ounces as compared with the output for the corresponding period of 1896. Increases took place in Westralia and Queensland; New South Wales remained practically stationary, and Victoria showed a cousiderable falling off.

A dispatch from Berne, Switzerland, reports that the Swiss National Council have adopted a bill for the purchase of the five principal railways of Switzerland at a cost approaching $200,000,000 aud have authorized a loan for the purpose. According to the latest official returns, there were 2304 miles of railway open for traffic in Switzerland ou January 1, 1896.

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Metal and Miscellaneous Prices.

CHICAGO, OCTOBER 14, 1897.

Tin—

Straits pigs.....15¼@15½¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
C, 14 x 28		$7.25
X, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
X, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
X, 14 x 56	21.00	$12.50
XX, 14 x 56	24.00	14.00
X, 14 x 60	23.00	13.50
XX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
S T P / L Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

Nos.	Common Americau.	Refined.
10 to 16	1.90¢	2.50¢
17 to 20	2 00¢	2.60¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, lb, A... $10.20 } 10%
Patent Planished, lb, B..... 9.20 } dis.
Craig's Polished Sheet Steel.....8½¢

Galvanized.

First quality.....dis. 80@80&2½%

Copper—*Ingot.*

Lake.....12¼@ 12½¢
Casting Brands.....11¾@ 12 ¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Slab Spelter—

Western Spelter.....4⅛@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9¼¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4½¢
Bar.....5¼¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O, G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.85

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin.... square,	$4.75	$4.50
Galv..... square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20 $25.50 square
IC Tin, 14 x 20..... 8.00 square
Steel Painted, 14 x 20.. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....2 ¢
" " Brown.....1¼¢
" " Purple.....2½¢
" " Ground in oil, B. Red, 6½¢
" " Ground in oil, Red...6½¢
" " Ground in oil, Brown, 5½¢
" " Ground in oil, Purple, 6½¢
Linseed Oil, Boiled, in bbls.....35¢
Linseed Oil, Raw, in bbls.....33¢
Mineral Paints.....1 @ 8¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans....8 ¢
kegs.3 to 6 ¢
Sipe's Japan Oil, in bbls., gal..... .34¢
Spirits Turpentine, in bbls., gal....36¢
Asphaltum, Trinidad Refined, ton.$45
Tarred Felt, 1 Ply, 100 lb.....$1.25
Tarred Felt, 2 Ply, roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, roll 108 sq. feet.....$1.25
Roofing Pitch, bbl. of 300 lb.....$3.00

NEW YORK, OCTOBER 15.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₱ ℔, 40¢
100-℔ lots.....₱ ℔, 36¢
Aluminum Rods, from ⅛-in. diam. to 1 in. diam.....₱ ℔, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 ℔s or more.

	6-in.	24-in.
Wider than.....	24-in.	30-in
And including.....	₱ ℔.	₱ ℔.
Nos. 18 to 19.....	$0.40	$0.43
" 20.....	.42	.45
" 21 to 23.....	.44	.47
" 24.....	.46	.49
" 25.....	.47	.50
" 26.....	.50	.55
" 27.....	.53	.58
" 28.....	.53	.00
" 29.....	.56	.05
" 30.....	.66	.73

Note.—Lots of less than 50 ℔s 5¢ ₱ ℔ extra.

Antimony—

Cookson.....₱ ℔, 8¼@8½¢
Hallett's.....₱ ℔, 7¾@8¢
Japanese.....₱ ℔, 7½¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 20, 1896.

Plain Round Tube.	Per ℔.	
¾-in. up to 2-in.	$0.35	35% off.
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝-in.	.38	
⅜-in. up to ½-in.	.41	
5-16-in. up to ⅜-in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3-in. and larger	Special	
2-in. to 3-in., to No. 19, inclusive.	.38	

Copper & Bronze Tubing—

3¢ ₱ ℔ more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₱ ℔ 13½@10¢ basis *Ingot.*
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₱ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....85%

Stove Pipe—

Buffalo Four-Piece

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.00	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....₱ ℔, 2 00....		2.30¢
Nos. 17 to 21.....₱ ℔, 2.10....		2.40¢
Nos. 22 to 24.....₱ ℔, 2.20....		2.50¢
Nos. 25 and 26... ₱ ℔, 2 30....		2.60¢
No. 27.....₱ ℔, 2.40....		2.70¢
No. 28.....₱ ℔, 2.50....		2.80¢
American B. B.....₱ ℔, 4¢		

Russia, Ptanished, &c.

Genuine Russia, according to assortment.....₱ ℔, 10¼@10½¢
Do. Stained.....0¢@10¢
Patent Planished ₱ ℔, A, 0¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₱ ℔, 8½¢

Galvanized.

Nos. 10 to 16.....₱ ℔, 12¢
Nos. 17 to 21.....₱ ℔, 13¢
Nos. 22 to 24.....₱ ℔, 14¢
Nos. 25 to 26.....₱ ℔, 15¢
No. 27.....₱ ℔, 16¢
No. 28.....₱ ℔, 17¢
No. 29.....₱ ℔, 19¢
No. 30.....₱ ℔, 21¢
75&10& 5% off.
30 in. 1¢ ₱ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4⅝¢
Bar.....5¼¢
Pipe.....6¼¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....7¼¢. 20%
Old Lead in exchange, 3¼¢ ₱ ℔.

Mitres, Eave Trough—See

Eave Trough Mitres.

Nickel—

Per ℔.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔.....5¾@6¢
Lead. Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ⅛ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1½¢
Red Venetian, American..... @1¾¢
"Donkey" Roofing Paint:
1 quart cans.....50¢
1 gallon cans.....$1.15
10 gallon cans..... 9.00
Linseed Oil:
Raw, ₱ gal..... @36¢
Boiled..... @38¢
Spirits Turpentine:
In bbls.....30½¢
In cases.....44½¢
Putty:
In barrels and ⅛ hbls..... ...1¾@2¢
In tubs.....1¾@2¢
In tin cans..... .....2½@3¢
In bladders .....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₱ ℔ 5 ¢
Clarified.....₱ ℔ 4⅞¢
Accra.....₱ ℔ 4¾¢
Half Jack.....₱ ℔ 4½¢
Cecilia.....₱ 100 ℔ $4.85
Choice Red.....₱ 100 ℔ 4.60
(*Spot Oil, ½c. ₱ ℔ higher.*)

Petroleum Products—

In Barrels (Barrel included).

Stove Gasoline..... ₱ gal. 10@11¢
Kerosene.....₱ gal. 8¢

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 0 inches.....70%
Fittings, Pipe, " " 75%
Extra Heavy Pipe, " " 75%
Fittings, Heavy Pipe, " " 75%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Registers—

1807 List:
Japanned.....50%
Nickel Plated..... 40&10%
Solid Bronze..... 25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%
1890 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary....	1¼	15¢
slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₱ ton.....$30.00@$35.00
Asphaltum, Rock. ₱ ton.....$14.00
Coal Tar Felt, 1 ply, ₱ ℔.....2¢
2 Ply Roofing, ₱ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₱ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₱ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₱ bbl.	$1.82@$1.83
Rosin, E. & F.....	₱ bbl.	1.84@ 1.87
Rosin, G. & H.....	₱ bbl.	1.90@ 1.95
Rosin, I. & K	₱ hhl.	2.00@ 2.05
Rosin, M. & N.....	₱ hbl.	2.10@ 2.25

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor,	₱ sqr.	$3.75@$5.00
No. 1 Bangor Ribbon.....		3.35@ 3.75
Pen Argyle,	₱ sqr.....	3.75@ 4.35
Peach Bottom,	₱ sqr.....	4.75@ 5.60
No. 1 Chapman,	₱ sqr....	3.80@ 4.80
Lehigh Slates,	₱ sqr.....	3.00@ 4.50

Vermont:

Sea Green,	₱ sqr.....	$2.50@$3.55
Purple,	₱ sqr.....	3.25@ 4.00
Unfading Green,	₱ sqr...	3.75@ 4.50
Red,	₱ sqr.....	9.00@11.00

Solder and Soldering Fluids— Solder—

½&⅓ guaranteed..... 10¾@11¢
No. 1..... 0¾@10½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Ftux.
f o.b. New York.
In harrels. ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢
Gedney's Soldering Ftuid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or harrel; money refuuded when returned.
Perfection Soldering Ftux.
No charge for package.
Bbls. about 500 ℔, ₱ ℔.....3½¢
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₱ ℔.....4¢
5% dis.
Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, ₱ ℔.....40¢

Soldering Coppers—

Per ℔.....15½¢@17½¢ net

Spelter—

Western Spelter.....4¾¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spirat.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₱ ℔.....15¼¢
Straits, pigs, ℔ ℔.....14¾¢
Straits, in bars, ₱ ℔.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.55
" "	IX,	10 x 14 / 14 x 20	5.55
" "	IXX,	14 x 20....	6.55
" "	IXXX,	14 x 20....	7.55
" "	IXXXX,	14 x 20....	8.55
" "	DC,	12½ x 17....	4.80
" "	DX,	12½ x 17....	5.80
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.15
" "	IX,	10 x 14 / 14 x 20	4.90
" "	IXX,	14 x 20...	5.65
" "	IXXX,	14 x 20...	6.40
" "	IXXXX,	14 x 20...	7.15

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔.....10¢
95 ℔.....15
90 ℔.....20¢
85 ℔.....25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating.....	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating.....	8.00 @ 9.25
STP / L Grade, 10 to 12 ℔ coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₱ ℔.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	0.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke, IC, 14 x 20.....	$4.25
IX, 14 x 20.....	5.10

Terne Plates—

MF, IC, 14 x 20.....	$0.37½
20 x 28.....	12.60
Worcester Grade, IC, 14 x 20.....	4.25
20 x 28.....	8.50
Dean Grade, IC, 14 x 20.....	4.00
20 x 28.....	8.00
Gilhertson's Old Method, IC, 14 x 20..	7.50
20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₱ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1805.

1¼ and less, Plain	72%
1¼ and less, Galv.....	07%
1½ and larger, Plain.....	78%
1½ and larger, Galv.....	70%
Screw and Socket Joint Casing.....	05%
Inserted Joint Casing.....	00%
Boiler Tubes, 2¼ inch and smaller.	72½%
" 2½ inch and larger	70%

Zinc—

600 ℔ casks ₱ ℔ 5¾¢ | Per ℔.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Electric Oil Stove Co., Homer, Mich.
Wheeler, Russell & Son, Utica, N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.
Wagner Mfg. Co., Sidney, O.

Architectural Ornaments.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Souther, E. E. Iron Co., St. Louis, Mo.
Weitzel, J. F., Cincinnati, Ohio.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Bake Pans.
Kieckhefer Bros. & Co., Milwaukee, Wis.

Baskets, Metallic.
Metallic Basket Co., Cedar Rapids, Ia.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Bath Tub Seats.
Wetter, H. Mfg. Co., Memphis, Tenn.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Copper.
Randolph & Clowes, Waterbury, Conn.

Boilers, Range.
Wolff, L. Mfg. Co., Chicago, Ill.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.
Ohdyke, W. A. & Co., Philadelphia, Pa.
Weitzel, J. F., Cincinnati, Ohio.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, O.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Directory of Manufacturers.
Thomas Publishing Co., 40 Broadway N. Y.

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Bliss, E. W. Co., Brooklyn, N. Y.
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Stiles & Fladd Press Co., Watertown, N. Y.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Electric Oil Stove Co., Homer, Mich.
Wheeler, Russell & Son, Utica, N. Y.

Filters, Rain Water.
New Idea Filter Co., Muncie, Ind.

Fire Brick.
Newton & Co., Albany, N. Y.
Preshrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Excelsior Steel Furnace Co., Chicago, Ill.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D. Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bihh, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Buckwalter Stove Co., Royersford, Pa.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Excelsior Steel Furnace Co., Chicago, Ill.
Fox, F. B., Cleveland, O.
Fox Furnace Co., Cleveland, O.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Mt. Penn Stove Works, Reading, Pa.
Pease, J. F., Fuel Co., Syracuse, N. Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Richardson & Boynton Co., 232-234 Water St., N. Y.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Superior Fdry. Co., Little Falls, N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Turner Heater Co., Bristol, Ct.
Union Stove Works, 70 Beekman St., N. Y.
Walker & Pratt Mfg. Co., Boston, Mass.
Wheeler, Russel & Son, Utica, N. Y.
Wood & Bishop Co., Bangor, Me.

Furnaces, Plumbers' and Tinners'.
Hull, M. L., Cleveland, O.

Galvanizing.
Gregory, Thos. Galvanizing Works, Brooklyn, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

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Kieckhefer Bros. & Co., Milwaukee, Wis.
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Grates.
Jackson, W. Sons, 246 Front St., N. Y.

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Watrous & Co., Troy, N. Y.

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Morris, Jno. B. Foundry Co., Cincinnati, O.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
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Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Empire Heating Co., Easton, Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 93 Liberty St., New York.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Johnson & Co., 84 John St., N. Y.
Mitchell Heater Co., Poughkeepsie, N. Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fuel Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
Kieckhefer Bros. & Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Wagner Mfg. Co., Sidney, O.

Hollow Ware, Aluminum.
Illinois Pure Aluminum Co., Lemont, Ill.

House Furnishing Supplies.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co., Boston, Mass.

Iron, Galvanized Sheet. (*See Sheets, Galvanized.*)

Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Huse, Jos. & Son, Boston, Mass.
Munsell, Eugene & Co., 218 Water St., New York.
Palermo Mica Co., 27 Peck Slip, N. Y.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Pipe, Water and Gas.
Miliar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Peck Bros. & Co., New Haven, Conn.
Randolph & Clowes, Waterbury, Conn.
Sproul & McGurrin, Grand Rapids, Mich.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wetter, H. Mfg. Co., Memphis, Tenn.
Wilson, R. M., Rome, N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Pokers and Lifters.
Arcade Mfg. Co., Freeport, Ill.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
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Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
West Mfg. Co., Buffalo, N. Y.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
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Clough, R. M., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.

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Gorman-English Co., Wilkes Barre, Pa.

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Castle, Wilmot & Co., Rochester, N. Y.
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Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.
Webster City Hot Water Heating Co., Webster City, Ia.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Registers.
Berger Bros., Phila., Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Ferrosteel Co., Cleveland, Ohio.
Highton, Wm. & Sons, Boston, Mass.
Schreiber & Conchar Mfg. Co., Dubuque, Iowa.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Roofing, Asphalt.
Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

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Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Bowers, L. M. & Co., Binghamton, N. Y.
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Cincinnati Corrugating Co., Piqua, O.
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Schools and Colleges.
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Scrap Metals.
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Stiles & Parker Press Co., Brooklyn, N. Y.
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Watrous & Co., Troy, N. Y.
West Mfg. Co., Buffalo, N. Y.

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Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N.Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
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McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.
Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

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Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

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Gait, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.
Watrous & Co., Troy, N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Stamped Ware, Aluminum.
Illinois Pure Aluminum Co., Lemont, Ill.

Statuary, Sheet Metal.
Mullins, W. H., Salem, O.

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Kieley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.
Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove and Metal Polish.
Adams Mfg. Co., Minneapolis, Minn.

Stove Patterns.
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Troy Nickel Works, Troy, N. Y.
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Stoves and Ranges.
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Emrich Co., Columbus, O.
Ferrosteel Co., Cleveland, Ohio.
Gem City Stove Co., Dayton, O.
Graff & Co., 208 Water St., N. Y.
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Magee Furnace Co., Boston, Mass.
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Michigan Stove Co., Chicago, Ill.
Miller, Wm. Range & Furnace Co., Cincinnati, O.
Mt. Penn Stove Works, Reading, Pa.
Noble, Chas. & Co., Phila., Pa.
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Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
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Schuylkill Valley Stove Co., Spring City, Pa.
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Sill Stove Works, Rochester, N. Y.
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Thatcher Furnace Co., 240 Water St., New York.
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Warren Hardware Co., Warren, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Adler, H., Tr. Pittsburgh, Pa.
Bradley, Munk & Co., Columbus, O.
Reineke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
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Electric Oil Stove Co., Homer, Mich.
Miller, Edward Co., Meriden, Conn.
Monarch Stove Co., Mansfield, O.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Union Stove Works, 70 Beekman St., N. Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., New York.
Hill-Whitney Aluminum Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tea Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co Rome, N. Y.

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Bertsch & Co., Cambridge City, Ind.
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Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tin Plate. (*Mfrs. of.*)
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphi Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Trade Schools.
New York Trade School, First Ave. and 67th St., N. Y.

Traps and Vents.
Sproul & McGurrin, Grand Rapids, Mich.

Tubing, Brass and Copper.
Randolph & Clowes, Waterbury, Conn.

Valves.
Eastwood Wire Mfg. Co., Belleville, N. J.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.
Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Waffle Irons.
Wagner Mfg Co., Sidney, Ohio.

Washers, Valves, &c.
Marston, I. G. & Co., Boston, Mass.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co., 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Zinc, Spelter.
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THE METAL WORKER.

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HELP WANTED.

A good all around TINSMITH; one accustomed to roofing, spouting, plain piping and pump work; none but sober and reliable men need apply. Chas. E. Bunce, Riverhead, N. Y. Oct. 16

A first-class experienced CORNICE CUTTER; none need apply who have not filled a like position; must give first-class references. John Seton, 78-80 Washington avenue, Brooklyn, N. Y. Oct. 16

To correspond with SALESMEN visiting the hardware trade in Eastern cities, who can handle a line of furnaces and registers to advantage. "Eastern," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

A man to travel in New England, representing a boiler and furnace manufacturer; must be an expert heating man, and one of good character. "Boiler," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

A first-class PLUMBER and TINSMITH; none but sober men need apply; send reference. E. F. Moore, Woodbridge, N. J. Oct. 9

A good all around TINNER and SHEET IRON WORKER for inside and outside work the year round; must be sober. John Lumm & Co., Garrett, Ind. Oct. 9

MILLWRIGHT and ROLL TURNER, by rolling mill; one preferred who is experienced in turning rolls for smooth rolled sheet iron. Answer giving full particulars to "R.," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Oct. 9

A TRAVELING SALESMAN by a concern manufacturing iron bedsteads and gasoline stoves; must be acquainted with the jobbing trade; only man of energy, ability and first-class references need apply. Address, with full particulars as to age, experience, references, salary wanted, P. O. Box 390, Milwaukee, Wis. Oct. 9

A TINSMITH and PLUMBER for steam and hot air heating, roofing, jobbing and assortment work; must be sober and reliable; state age, wages and experience. M. Mond, Ozone Park, L. I., N. Y. Oct. 9

A FURNACE and RANGE SALESMAN for Brooklyn and vicinity; please state terms wanted and give references. Address "Brooklyn," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

A good TINSMITH and JOBBER to come and locate in a live New England town. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

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By young man as TIN and SHEET IRON WORKER and GENERAL JOBBER; understands all kinds of inside and outside work; good roofer; permanent job desired; country town preferred; 12 years' experience. "F. J. G.," 45 Marvin street, Saratoga Springs, N. Y. Oct. 16

By an experienced METAL PATTERN MAKER on locks, builders' hardware, iron toys and novelties; familiar with up to date shop practice; a man of ideas and competent to take charge; at present employed, but desires to make a change. "Pattern Maker," 92 Laurel street, Bridgeport, Conn. Oct. 16

As TRAVELING SALESMAN with tin plate, corrugated iron or metal ceiling manufacturer; South or West preferred. "Z. No. 1016," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

A practical FURNACE MAN, who for the past five years has been employed respectively as foreman and salesman with large concerns in a large city, would like to make a change; understands machinery and the making of furnace fittings, &c., by machinery; 25 years's experience; references; can estimate and locate. "Foreman or Salesman," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

By a young man to do soldering on tinware in factory or shop; factory preferred. "F. J. L.," P. O. Box 16, Hawley, Pa. Oct. 16

By a first-class TIN and SHEET IRON WORKER for inside and outside work; over 20 years' experience. F. Hinrichs, 214 Sheldon street, Hartford, Conn. Oct. 16

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By young man as TINNER or CLERK; capable of taking charge; first-class refereuces; strictly temperate and character above reproach. Kerr, 257 West 114th street, New York City. Oct. 16

By STOVE DESIGNER and CARVER after October 15; up to date on design; references. "A.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Oct. 16

As FOREMAN of pattern shop in stove foundry; experienced on stove construction; reference given. "H.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Oct. 16

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By a good all around TINSMITH; can do inside and outside work; also steam and gas fitting; steady and sober; 12 years' experience. W. Pahland, 374 Spring street, West Hoboken, N. J. Oct. 9

By a first-class TIN and SHEET IRON WORKER; well experienced in furnaces and ranges, ventilating and jobbing work; New York City or Brooklyn preferred. "Mechanic," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

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By a young man; strictly sober, honest and reliable; would like to finish plumbing and tinning trade; position in a good house where honest efforts will be appreciated and advancement offered; reference first class. Box 6, Dawnsville, N. Y. Oct. 9

By a young man, age 22 years; sober, honest and reliable, with seven years in general hardware, including nearly all branches; would like position with a good retail house where honest efforts will be appreciated and advancement offered; can furnish gilt edge reference. Box 6, Dawnsville, N. Y. Oct. 9

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As FOREMAN in cornice and skylight shop by a first-class draftsman and cutter; can estimate on all kinds of cornice, skylight, roofing, and can handle men to good advantage; good references. Fred. Nichols, 2659 Colorado street, Philadelphia, Pa. Oct. 9

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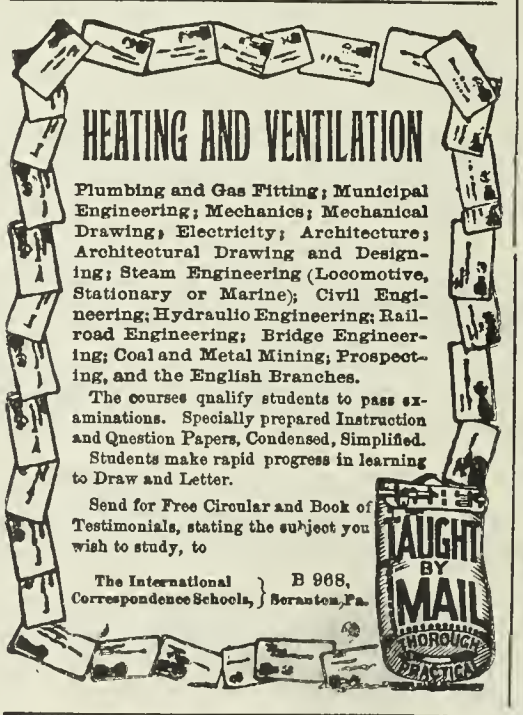
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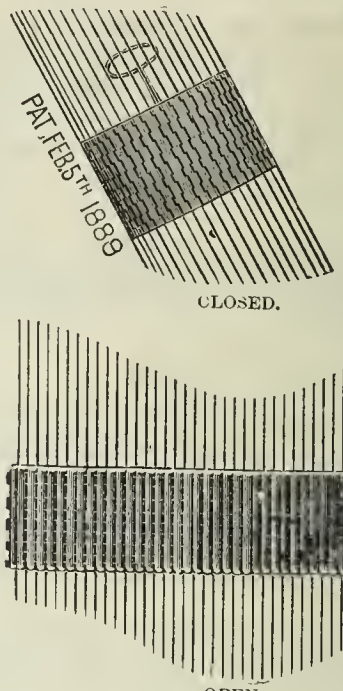

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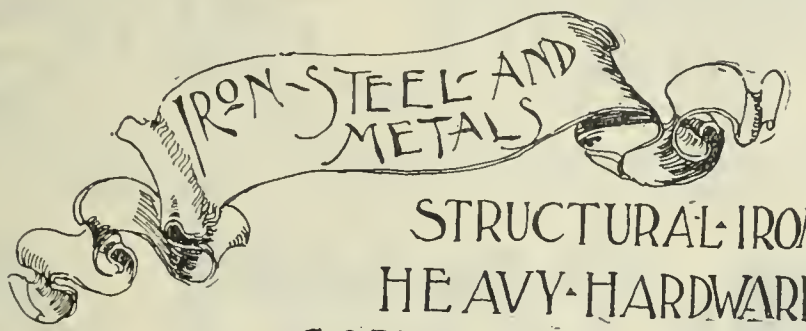

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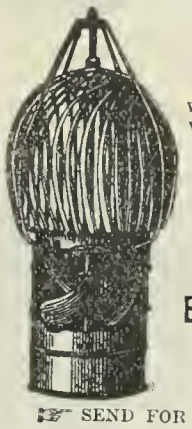

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—A SHORT CUT.—"Mr. Priggs is a very ordinary sort of man," remarked the candid observer.

"Undoubtedly," replied Senator Sorghum.

"While Mr. Diggs is exceptionally brainy."

"I believe so."

"And yet Priggs has succeeded and Diggs has failed. How do you account for it?"

"Easily enough," replied Senator Sorghum. "Diggs put in his time trying to learn more than other people, while Priggs devoted himself to convincing them that he already knew it."—*Washington Star.*

—BUSINESS IN THE BLUE GRASS REGION.—The blue-grass colonel relates an incident which well illustrates the shrewdness of the Kentucky grangers in business affairs. It appears that a farmer lost a calf, and a neighbor pastured it until the bill amounted to about the value of the animal. The owner found out one day where his missing calf was and went after it.

"How about the bill for this?" he inquired.

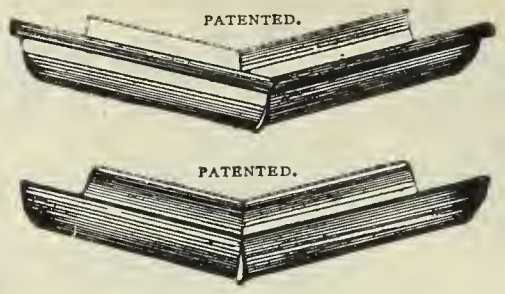
"Well, I've been thinking about that," was the reply, "and I've concluded that if you'll let me have the calf I'll call the matter square."

The old man thought over the situation for a while. Then he said: "Bill, the calf is really worth more than your claim, but I'll tell you what'll I do; if you will pasture the calf for four weeks more for nothing, you may have it."—*Chicago Times-Herald.*

—NOT AN INAPPROPRIATE NAME.—"I presume," said the talkative man to his seat mate in the railway train, "from your manner and conversation that you have family ties."

"Yes," replied Mr. Meekton; "I s'pose you might as well call 'em that. I buy 'em for myself, but my wife and the girls all wear 'em whenever they feel like it."—*Washington Star.*

MITRES



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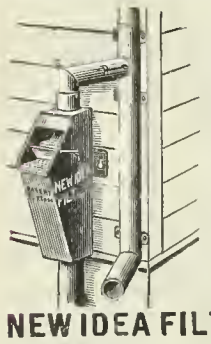

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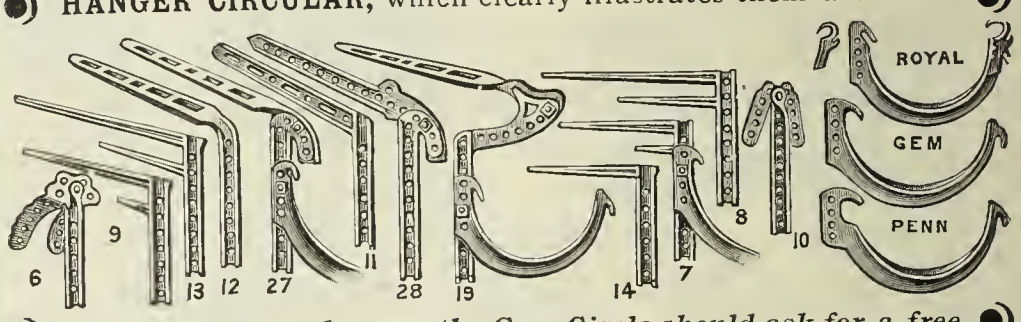

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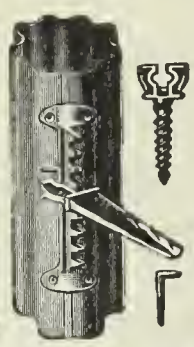

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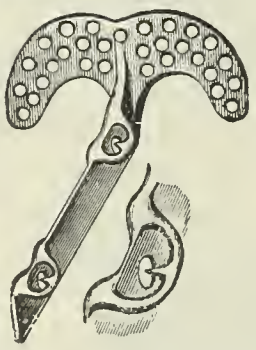

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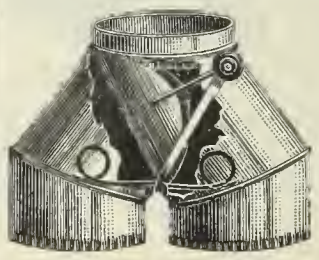

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"Why, five feet, my son."

"No, father, that isn't right."

"How so, my son?"

"Why, he would have only four feet. You see, calling his tail a foot doesn't make it a foot."—*Modes and Fabrics.*

—NOTHING LEFT TO REPEAT.—Mother—What did your father say when he saw his broken pipe?

Innocent—Shall I leave out the wicked words, mamma?

Mother—Certainly.

Innocent—Then I don't b'lieve there is anything to tell you, mamma.—*Dublin World.*

—TWO GERMAN GOKES.—Herr Oil—Haf you heard dot dog of mine ate a tape measure und died?

Herr Kut—I suppose he died py inches, nicht var?

Herr Oil—Aber nit; he vent oudt in der alley und die py der yard.—*Columbia Spectator.*

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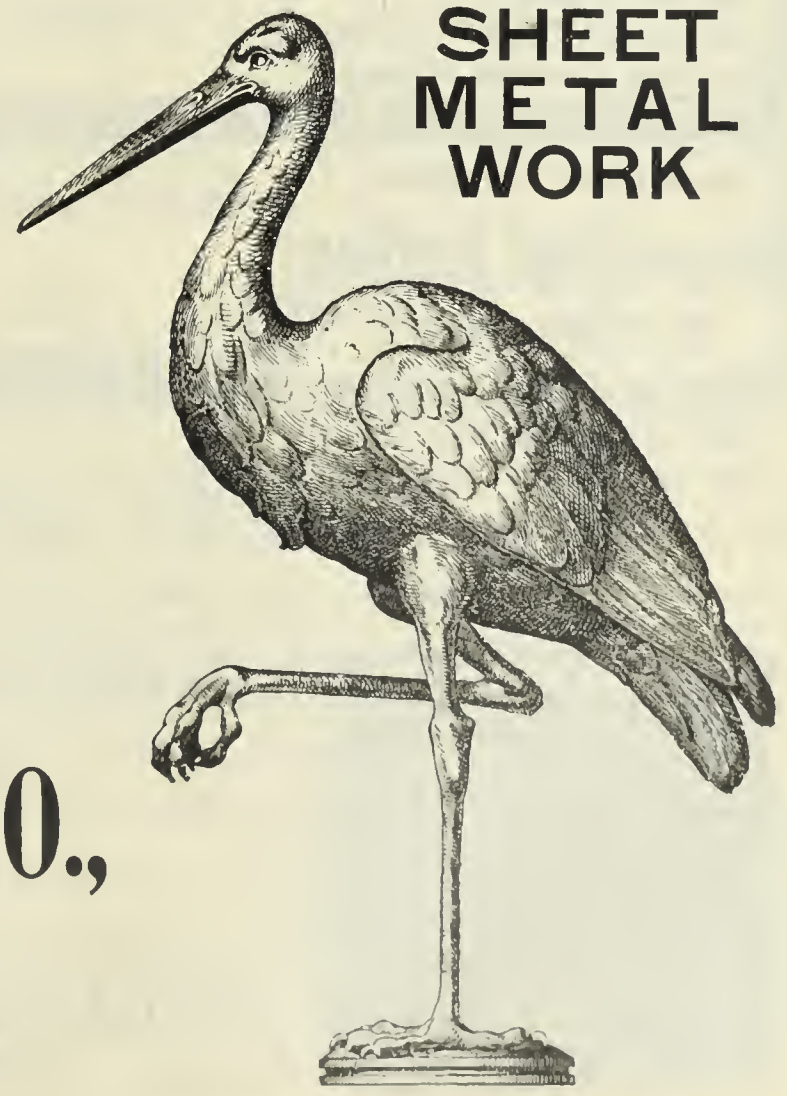

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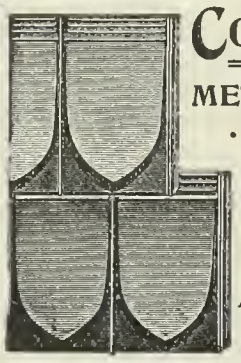

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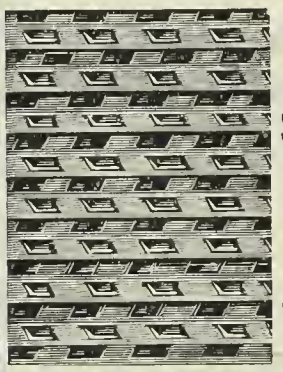

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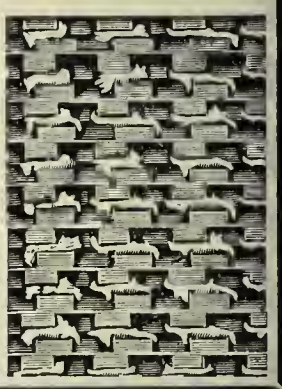

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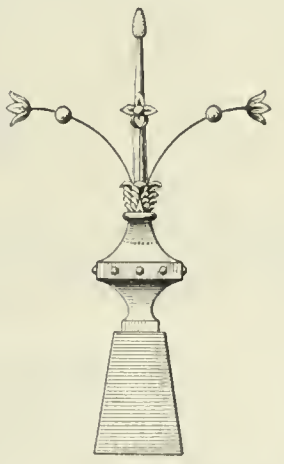

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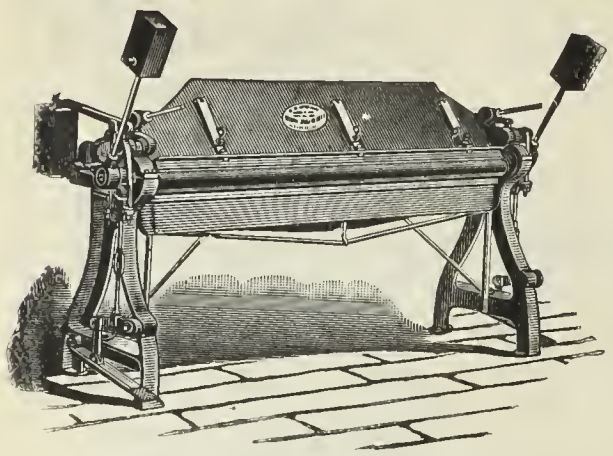

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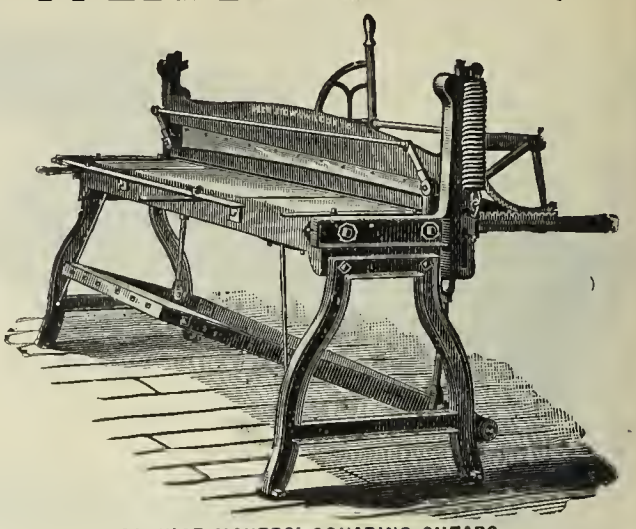

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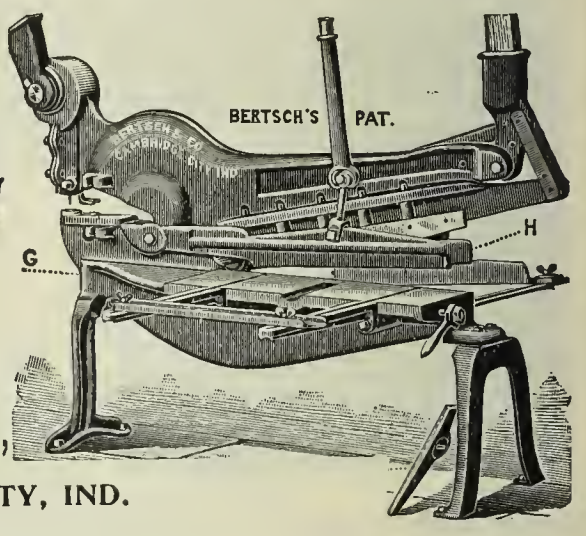

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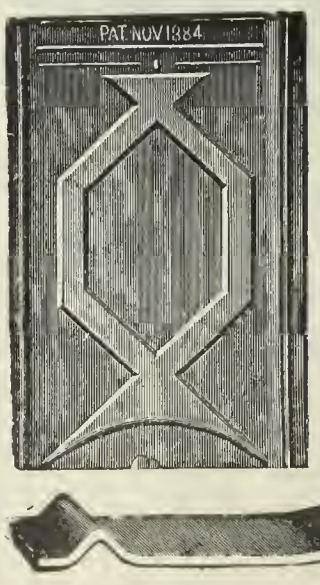

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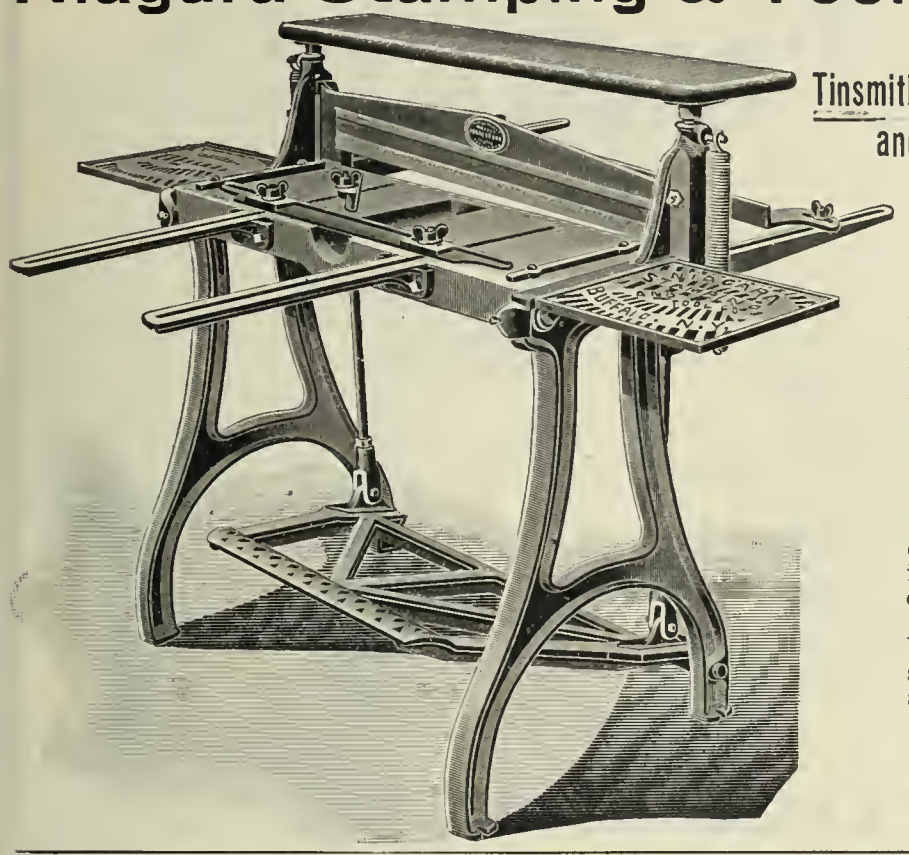

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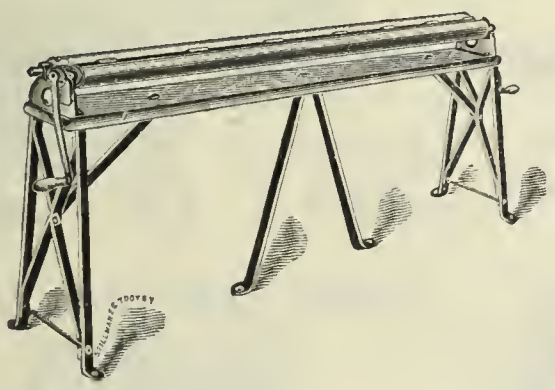

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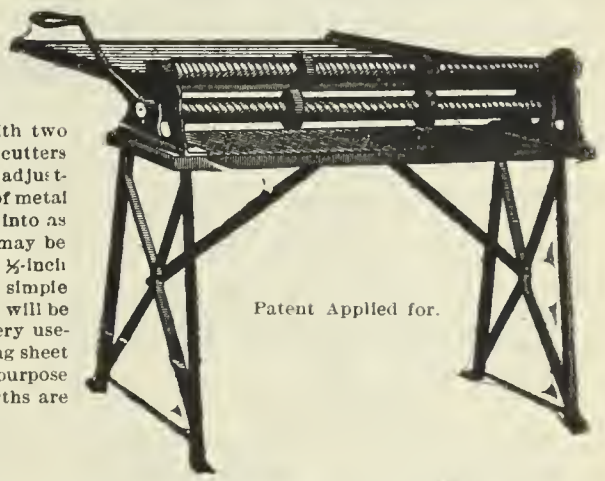

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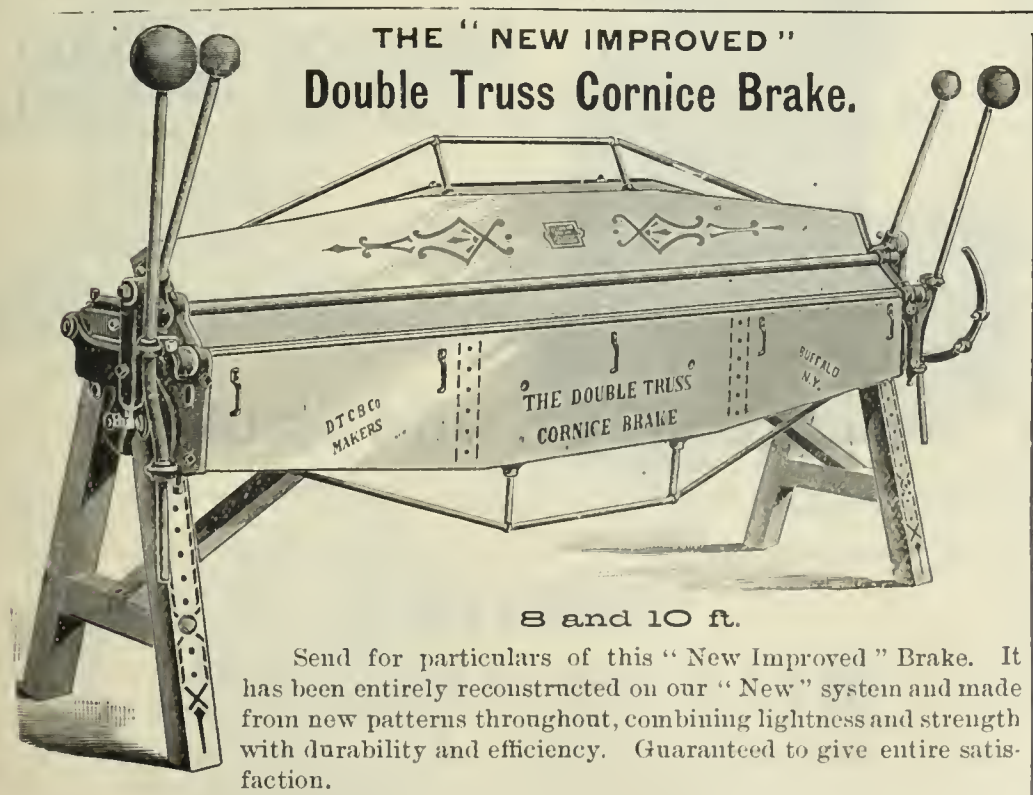

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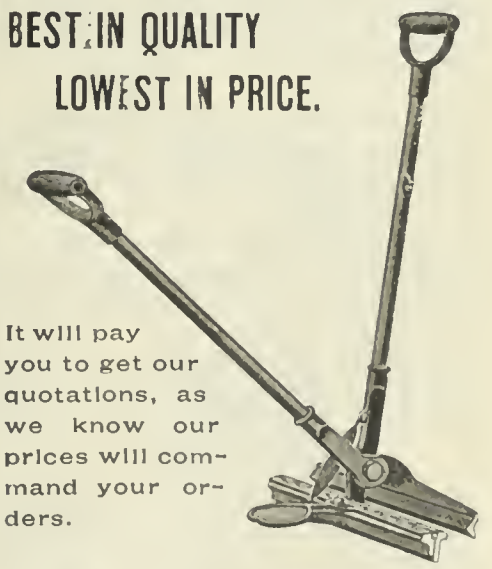

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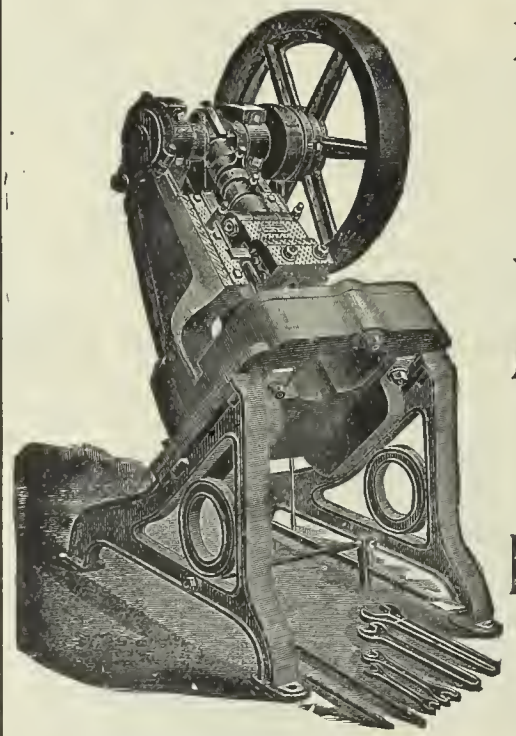

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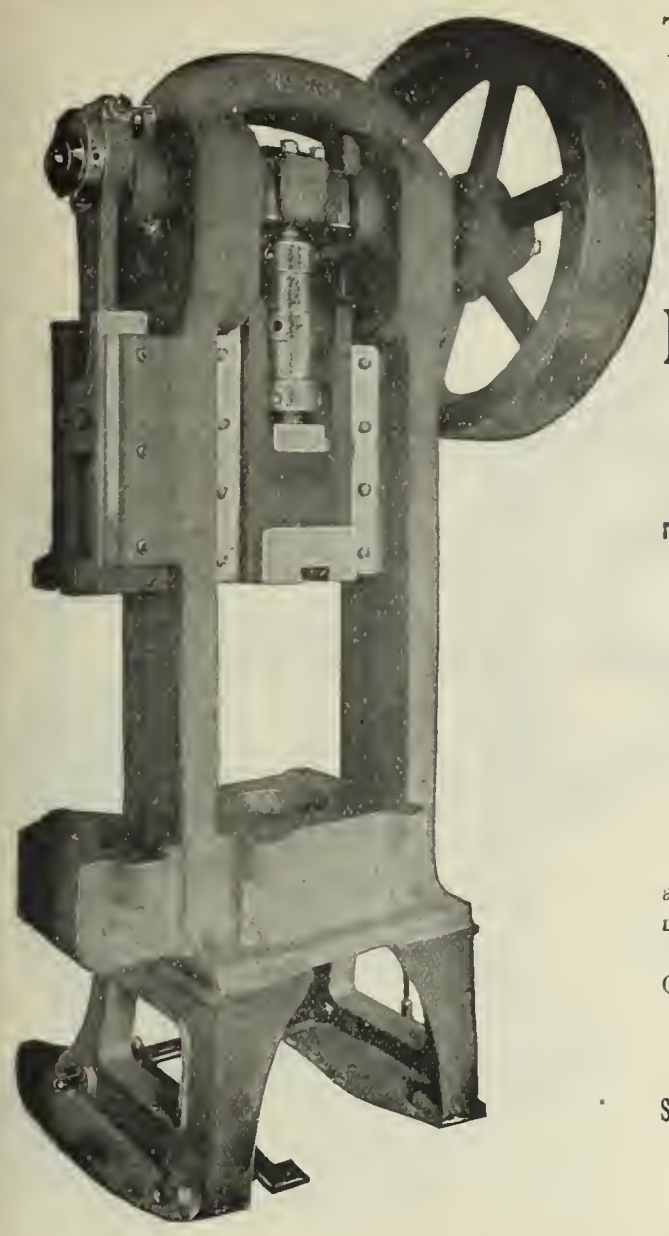

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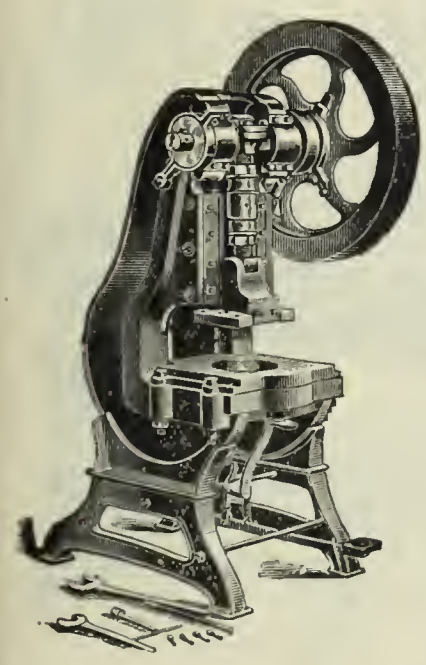

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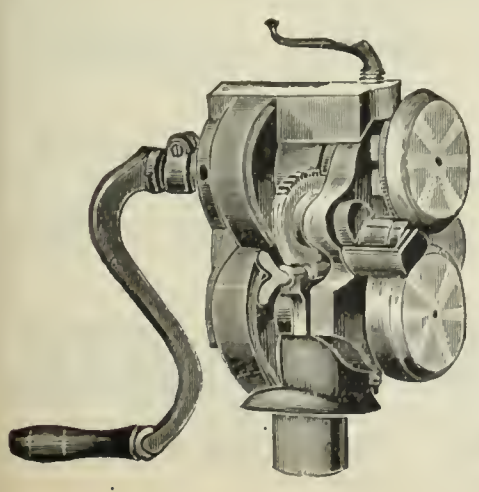

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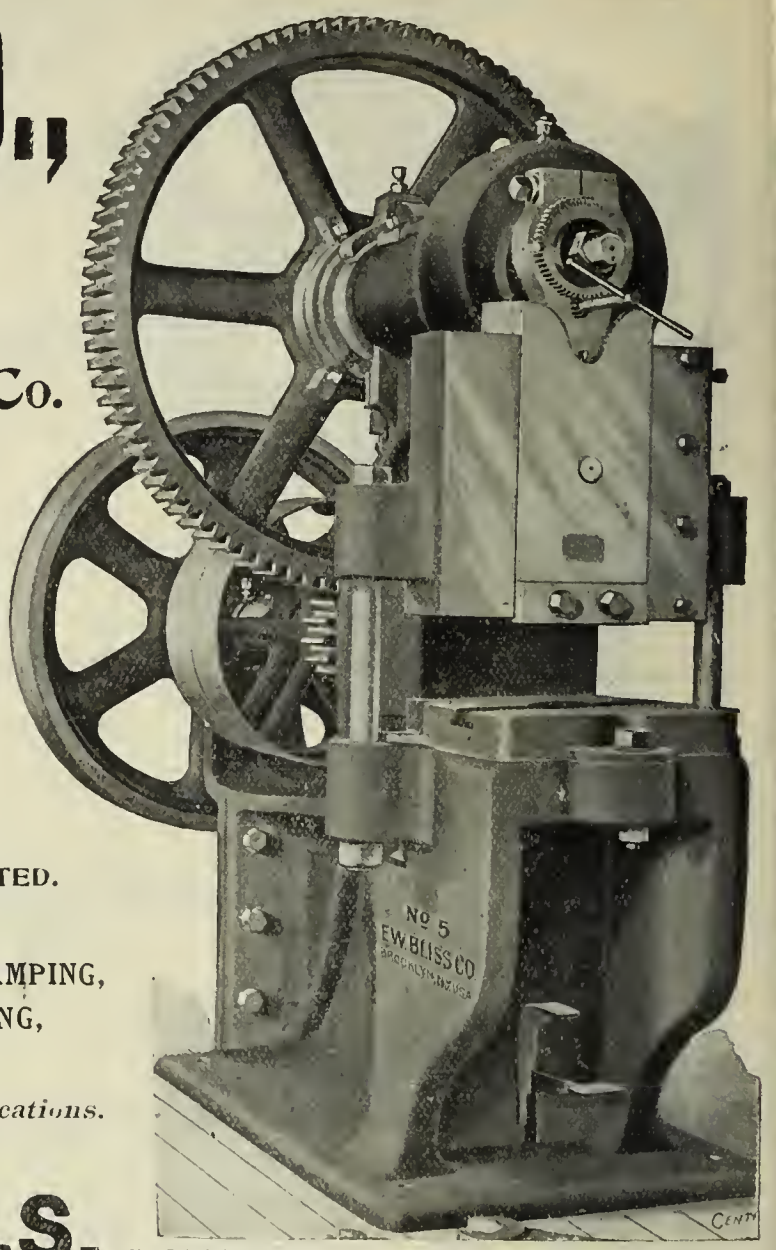

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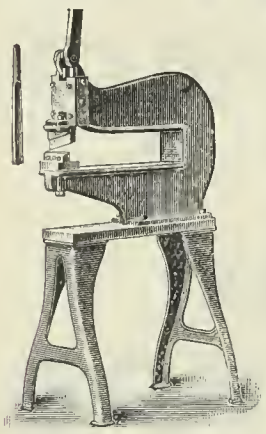

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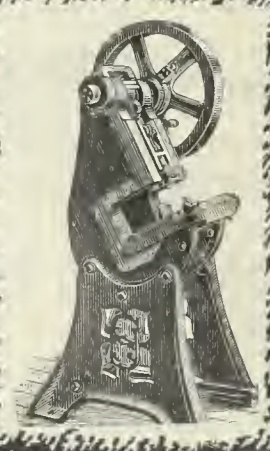

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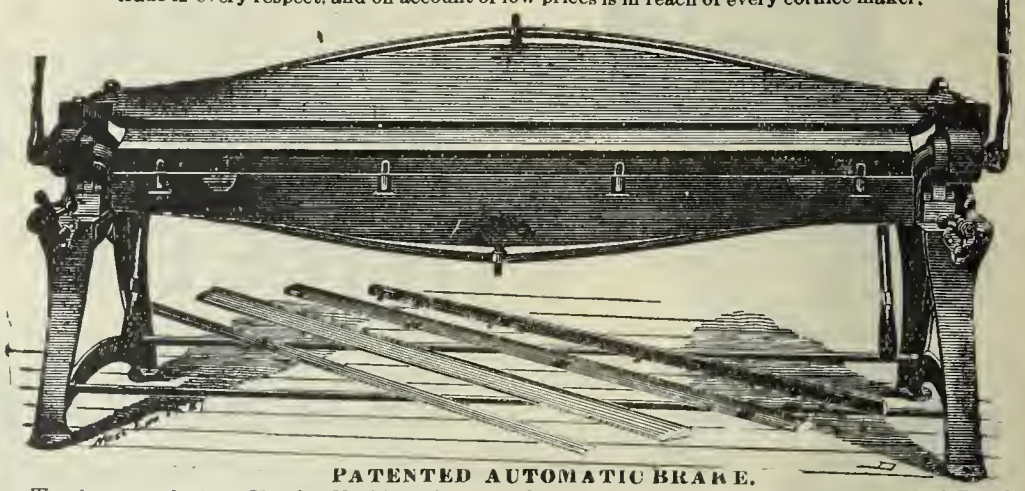

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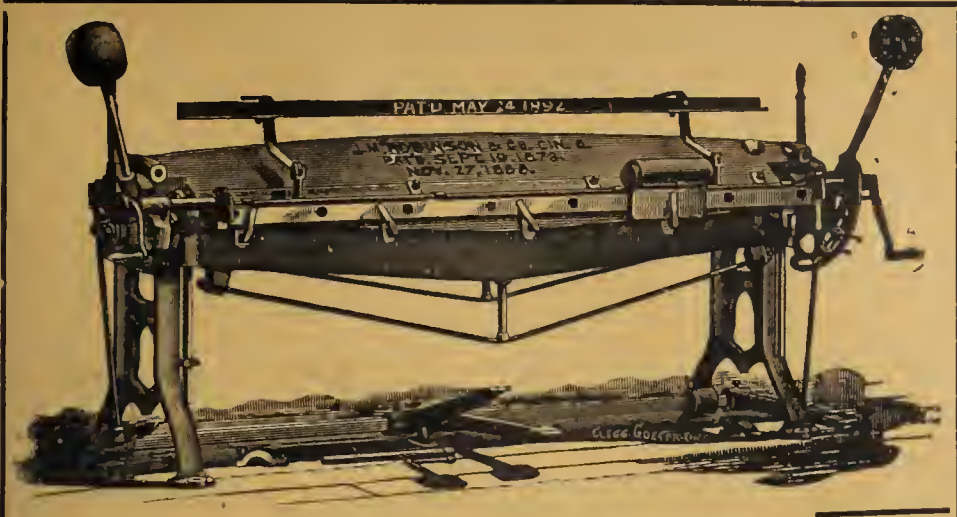

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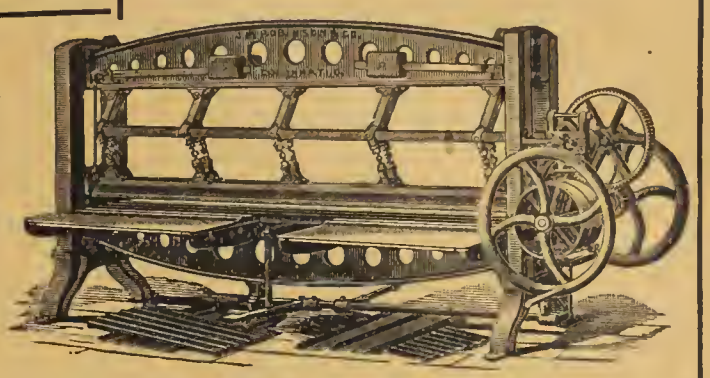

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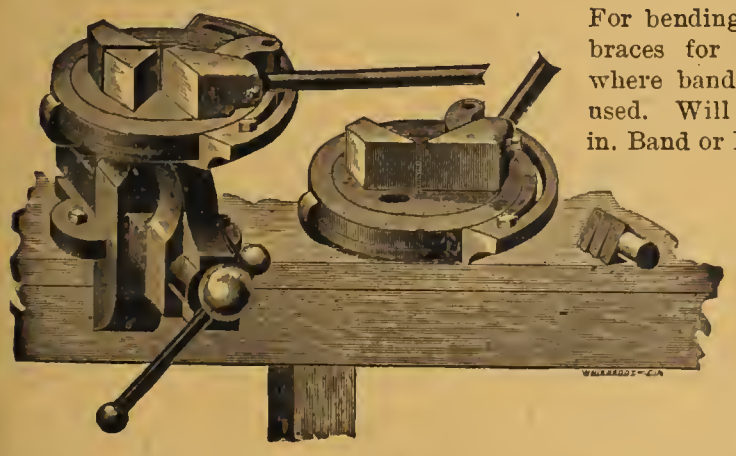

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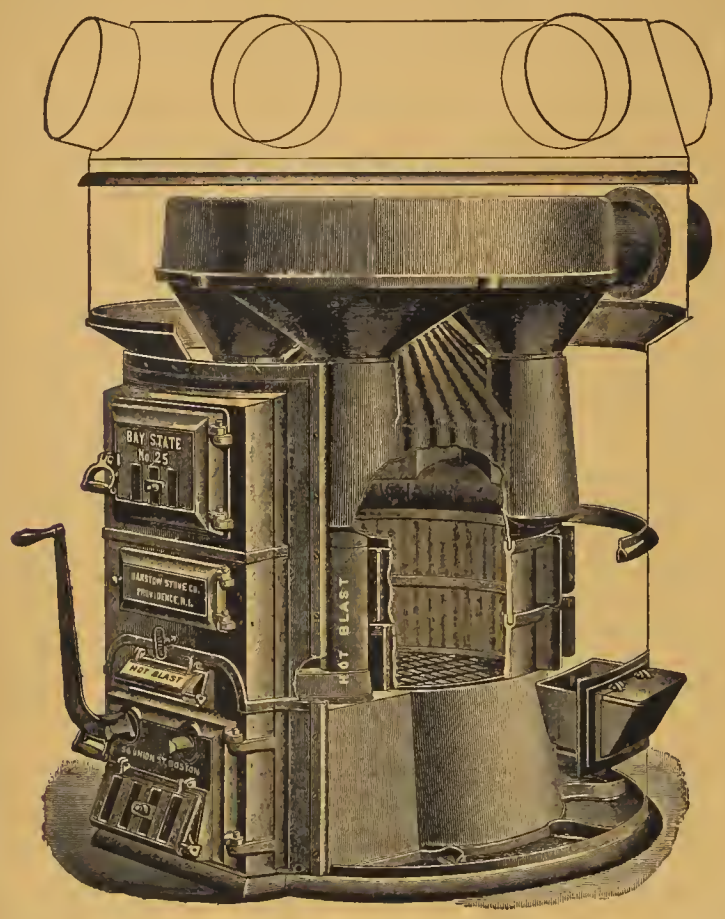

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CAST IRON PIPE and SPECIALS for WATER and GAS. Also Flang Pipe and Fittings, Hydrants, Gates, Pig Lead, etc. CHAS. MILLAR & SON, Selling Agen Utica, N. Y. Manufacturers of Lead Pipe and Plumbers' Materials. Wholesale Easte Agents Akron Vitrified Sewer Pipe.

W. Dewees Wood Co. *McKeesport, Pa.*
Sole Manufacturers of Woods Smooth Irons
and Patent Planished Sheet Irons.

Going Behind!

Yes! and the trouble's with yourself. **Just look around** —more than likely that range or heater you are trying to sell is a back number, not up to the times, couldn't sell it if you were twice as smart. Get a bright, well advertised, thoroughly well made line like the

GLENWOOD

and success is sure.

Write the Weir Stove Co., Taunton, Mass.

McClure's Re-dipped
Brand of Roofing Tin.

American Made. Guaranteed Superior Quality.

McCLURE & CO.,

TIN PLATE AND METALS.

PHILADELPHIA, 115 North 7th St. PITTSBURG, PA. 211—213—215 Second Ave.

Index to Reading Matter, Page 71.

Index to Advertisements, Pages 74 - 76.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. XLVIII. NO. 17.

NEW YORK AND CHICAGO, OCTOBER 23, 1897.

ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

SEAMLESS BRASS AND COPPER TUBES.

RANDOLPH & CLOWES, WATERBURY, CONN.

MANUFACTURERS OF FLUSH & SUPPLY PIPES. BASIN LAVATORY LEGS AND BRACKETS. AND BATH QUARTER BEND SLIP JOINT SUPPLIES CLOSET CONNECTION.

EET
PER AND
ET BRASS
SS WIRE
ZED TUBES
ULDINGS

DEPOTS. 226 LAKE ST. CHICAGO, ILL. 143-147 OLIVER ST. BOSTON, MASS.
BRANCHES PHIL'A, PA. 421 CHESTNUT ST NEW YORK, N.Y. BROADWAY & MURRAY ST. CINCINNATI, OHIO. NEAVE BLDG.

The "Gorton Side-Feed" Boilers

WILL BURN HARD OR SOFT COAL.

You Want the Best. We Have It.

SEND FOR CATALOGUE AND INVESTIGATE FOR YOURSELF.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

American Seal.

Elastic Oil Roofing Cement

For Slate and Tile Roofs.

Metallic and Graphite Paint,

WILLIAM CONNORS,

TROY, N. Y.

PARAGON HOT AIR FURNACES

SIX POINTS ~ 1·FEWEST JOINTS 2·EQUALIZED DRAFT 3·LARGEST RADIATING SURFACE 4·ABSOLUTELY SELF CLEANING 5·BALL BEARING GRATE 6·PERFECT ADAPTABILITY TO ANY KIND OF COAL

ISAAC A. SHEPPARD & CO. —MANUFACTURERS PHILADELPHIA, PA. & BALTIMORE, MD.

Write for our FURNACE BOOK "HINTS ABOUT HEATING" It will interest you IT MAY HELP YOU

EXCLUSIVE RIGHTS GIVEN TO ENTERPRISING DEALERS

TRADE APOLLO BEST BLOOM MARK

APOLLO GALVANIZED IRON.

The worker can't afford to do a job with any other. ome jobs he can't do well, and some he can't do at l with common irons.

Apollo is perfect and workable; others less perfect id far le s workable.

Apollo jobbers carry large stocks and get anything ecial immediately.

Apollo Iron and Steel Company, Pittsburgh, Pa.

Gray Iron Castings. S. CHENEY & SON, Manlius, N. Y.

EASTWOOD VALVE.

EASTWOOD WIRE MFG CO. - Belleville, N. J.

WILLIAMS STOVE LINING CO., TAUNTON, MASS., Manufacturers of FIRE BRICK LININGS.

GALVANIZED RANGE BOILERS.

Read the reports in this paper of higher priced steel and ask us for price of Boilers 150 pound test or heavier. Ask at the same time for price on any class of Tinners' or Plumbers' Supplies.

E. S. WHEELER & CO.,

256 Water St., New Haven, Conn.

New York Store, 191 Front St.
Boston Office, 220 Devonshire St.

team Specialties.

ump Governors, team Traps, team and Water educing Valves. ank Temperature

Noiseless Back Pressure Valves, Water Arches, and Oil Separators. Controller.

KIELEY, 9-17 W. 13th St., NEW YORK

WE CLAIM THE FOLLOWING MERITS FOR JENKINS BROS.' VALVES.

1. Manufactured of the best Steam Metal.
2. No regrinding, therefore not constantly wearing out the Seat of the Valves.
3. Contain JENKINS DISC, which is suitable for all Pressures of Steam, Oil and Acids.
4. The Easiest Repaired, and all parts Interchangeable.
5. Every Valve Tested before leaving the factory.
6. ALL GENUINE stamped with Trade-Mark.

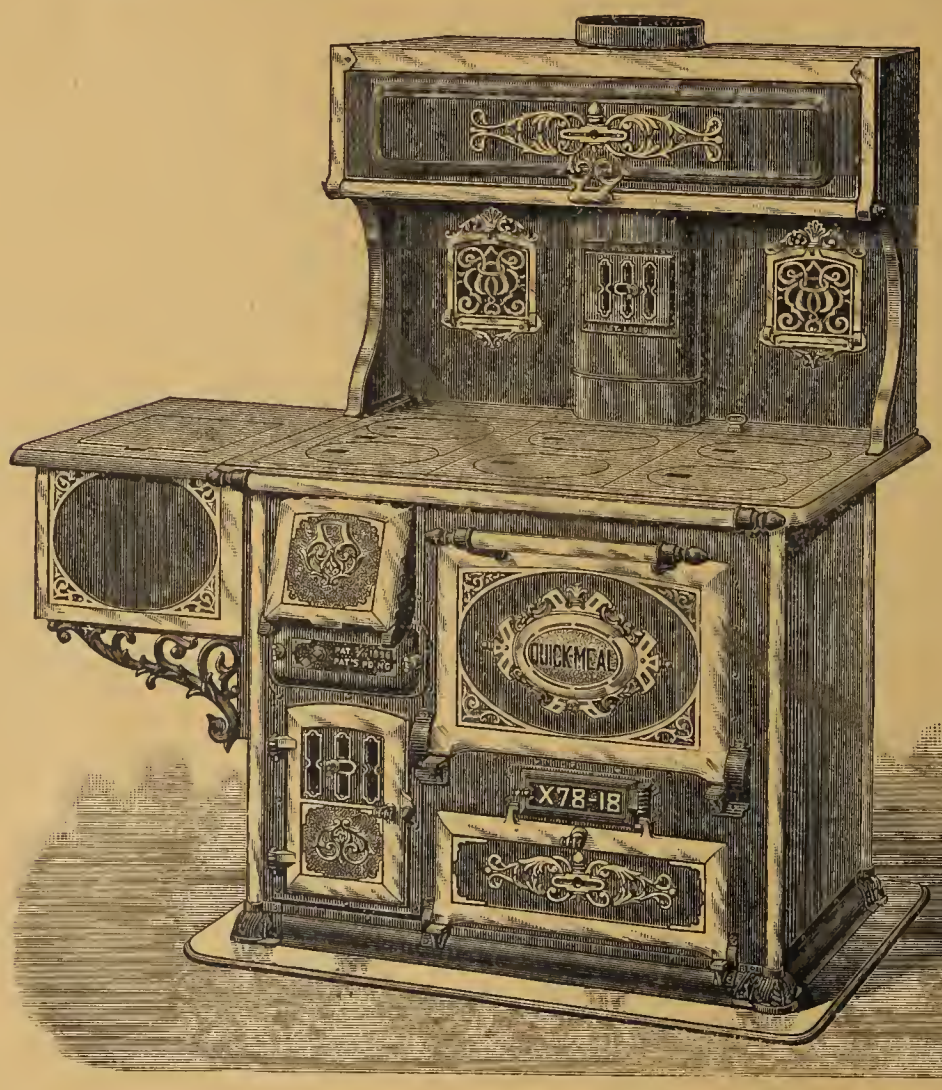
JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.

SEE THE MAGEE Advertisement PAGE 22.

QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL THAT'S WHAT THEY ARE. QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL

QUICK MEAL

STEEL RANGE.



There are no Steel Ranges made that equal the "Quick Meal."

Not because we are smarter and bigger than others in the business, but because "Our Standard is Higher," and all our energies and efforts are bent towards reaching it.

The "Quick Meals" for 1897 are far ahead of our last season's Ranges, yet you know how good they were then—how superior and how popular!

They are now so much improved, and so fully meet every requirement of a Steel Range, that they have won constantly increasing sales. Even the most exacting pronounce them the "Recognized Standard of Excellence."

"That's What They Are."

RINGEN STOVE Co. SAINT LOUIS

EVERY SQUARE INCH OF

RADIATING SURFACE

Of this FURNACE is

FIRE SURFACE.

Self
TRENCH PLATING
Radiator.

SELF CLEANING
Radiator and Flues.

NO BOLTS.

Heavy, Durable and Economical.

Send for our GOLDEN JUBILEE Anniversary FURNACE CATALOGUE.

1847-1897.

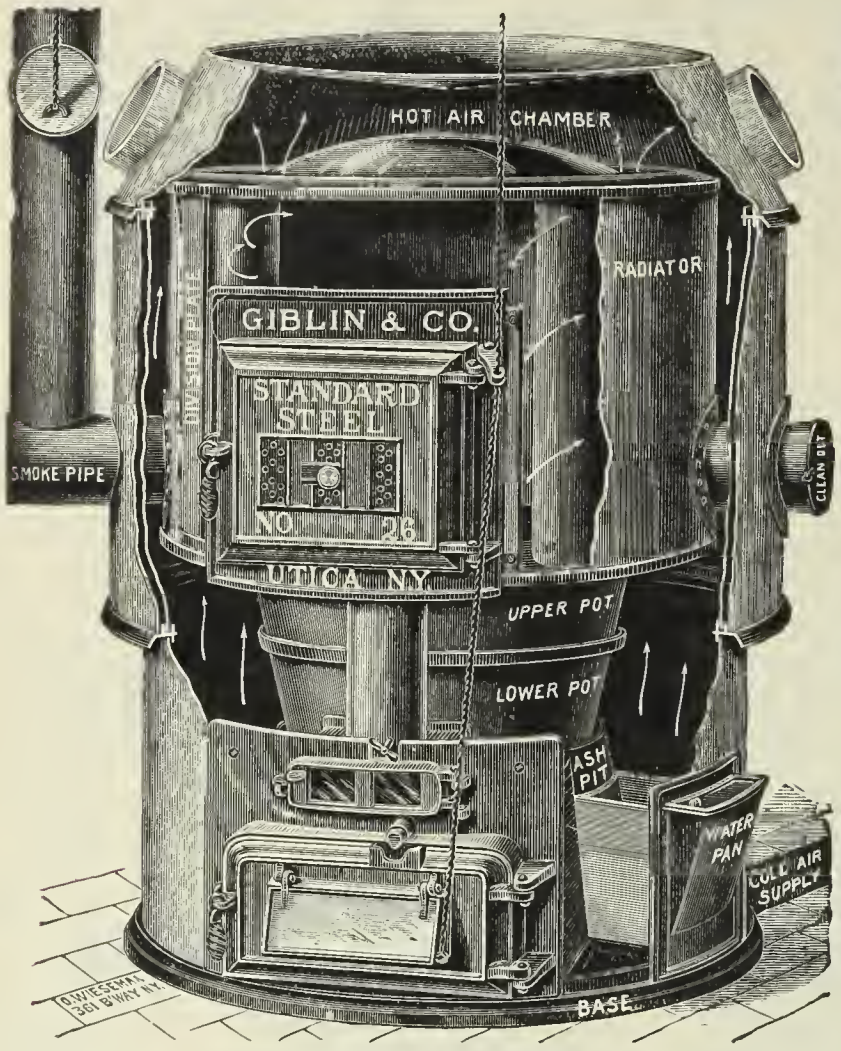
If interested in Steam and Water Boilers—we make a most complete line, and you should send for our New Boiler Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *50 Years,*

UTICA, N. Y.

High Grade Heaters.



Nothing Has Been Spared

to make this a perfect heater, and the universal demand for them has shown they have merits which are thoroughly appreciated by the trade.

SOME DEALERS

believe that the quicker a furnace gives out the more business they will have to do, but such dealers

MUST NOT BUY

these furnaces. These furnaces are made to heat and to last and there are many thousands of them in use that have been in constant use for the past ten years and

NOT ONE CENT

expended on them for repairs. There are furnace buyers who appreciate a heater of this kind and know that they can afford to pay more for it than for one that will

NEED REPLENISHING

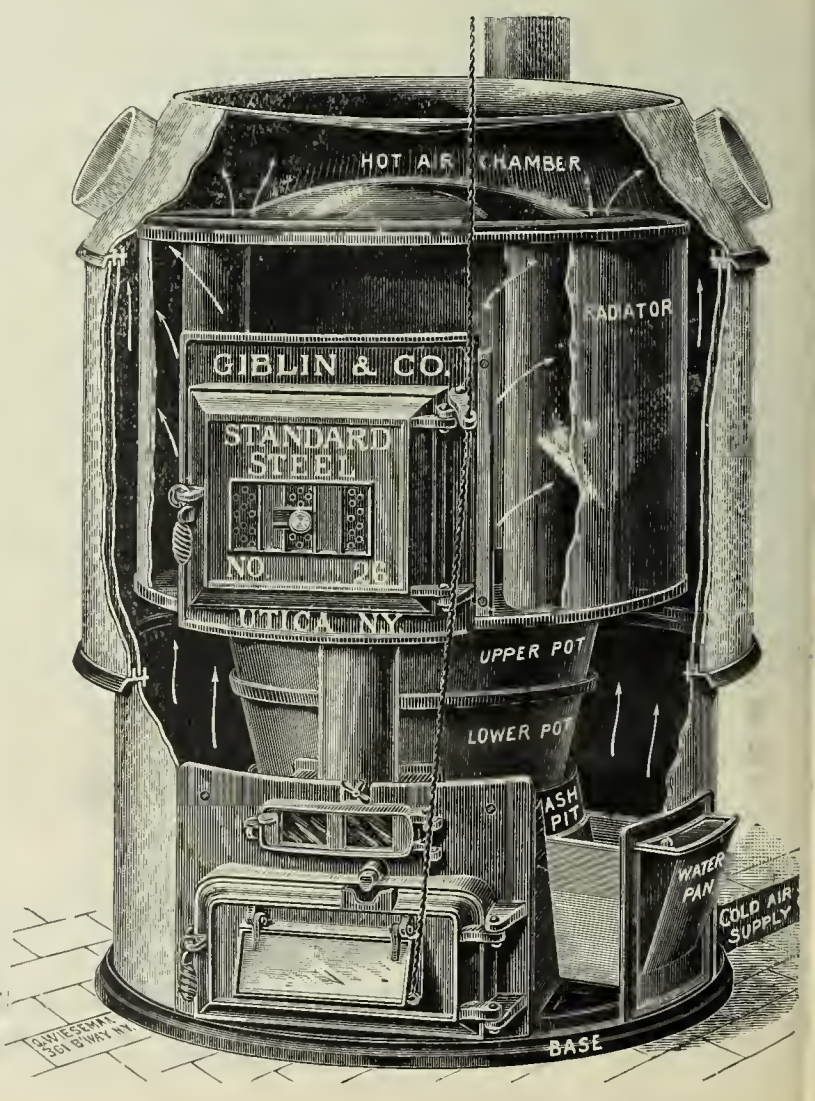
every other year. We claim for this furnace

durability; available for hard coal or wood; quick response to action of drafts; enlarged radiating surface; indirect draft, and consequent economy of fuel and ease of management. The

DEALERS WHO BUY

these furnaces are a multitude; the others can increase their business and add to their information by finding out what our **CATALOGUE** and **QUOTATIONS** will give them.

We can make prompt shipment at reasonable prices

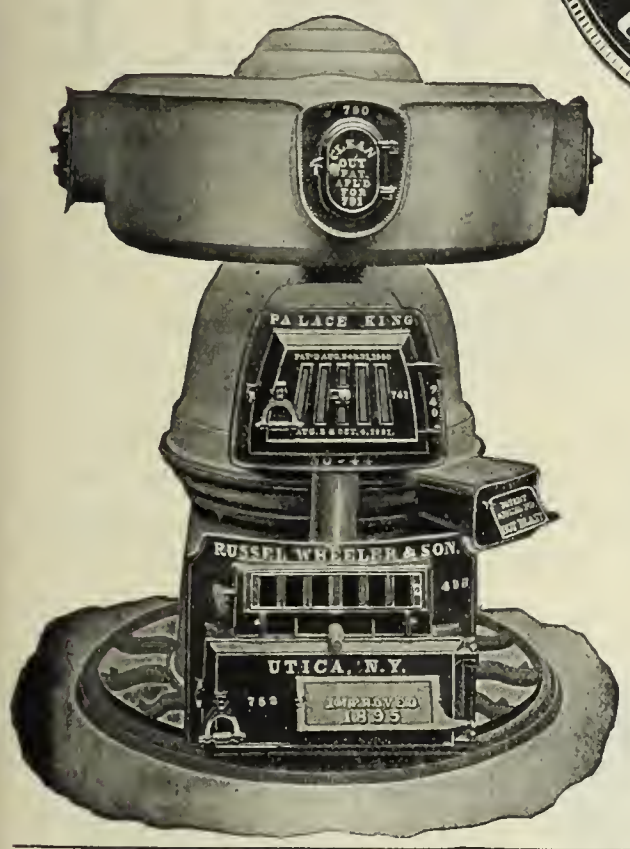


GIBLIN & CO.,

UTICA, N. Y.

ESTABLISHED 1842.

Save Your Coal. RUSSEL WHEELER & SON Wheeler TRADE MARK PALACE KING AND PALACE QUEEN HOT AIR FURNACES STEAM & HOT WATER BOILERS STOVES UTICA, N.Y. U.S.A. Save Your Coal.



IN CASE OF FIRE,

SAVE YOUR COAL.

You can Save Coal, and Money too, by using our Heaters.

THE FORBES WARM AIR FURNACE.

PHILADELPHIA, April 10, 1897.

Messrs. TUBULAR HEATING AND VENTILATING CO., 228 Quarry Street, Philadelphia.

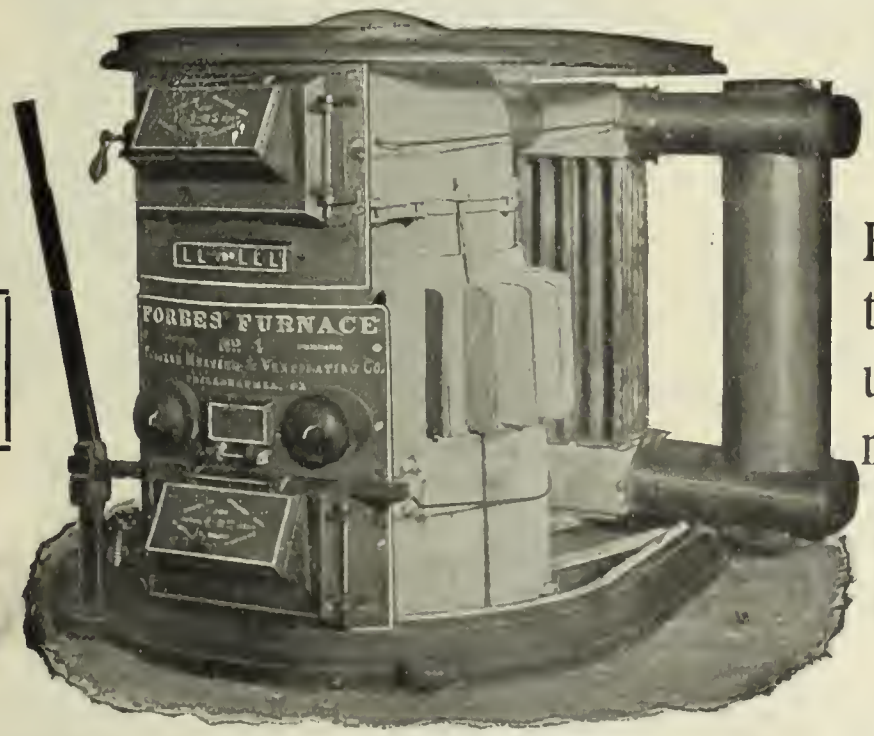
GENTLEMEN:—The Forbes Warm-air Furnace placed in my house last fall has given me entire satisfaction.

During the greater part of the winter the house had to be kept at a very high temperature, owing to illness in the family. Your furnace did all it was called upon to do, and on a remarkably small amount of coal.

Last winter a furnace of a popular make failed to even warm the house comfortably, and burned fully 50% more coal.

I think your furnace is all you claim for it, and do not hesitate to recommend it to any one desiring comfort and economy. Very truly,

5027 Florence Avenue. M. J. FALLS.



SEND FOR CATALOGUE

COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

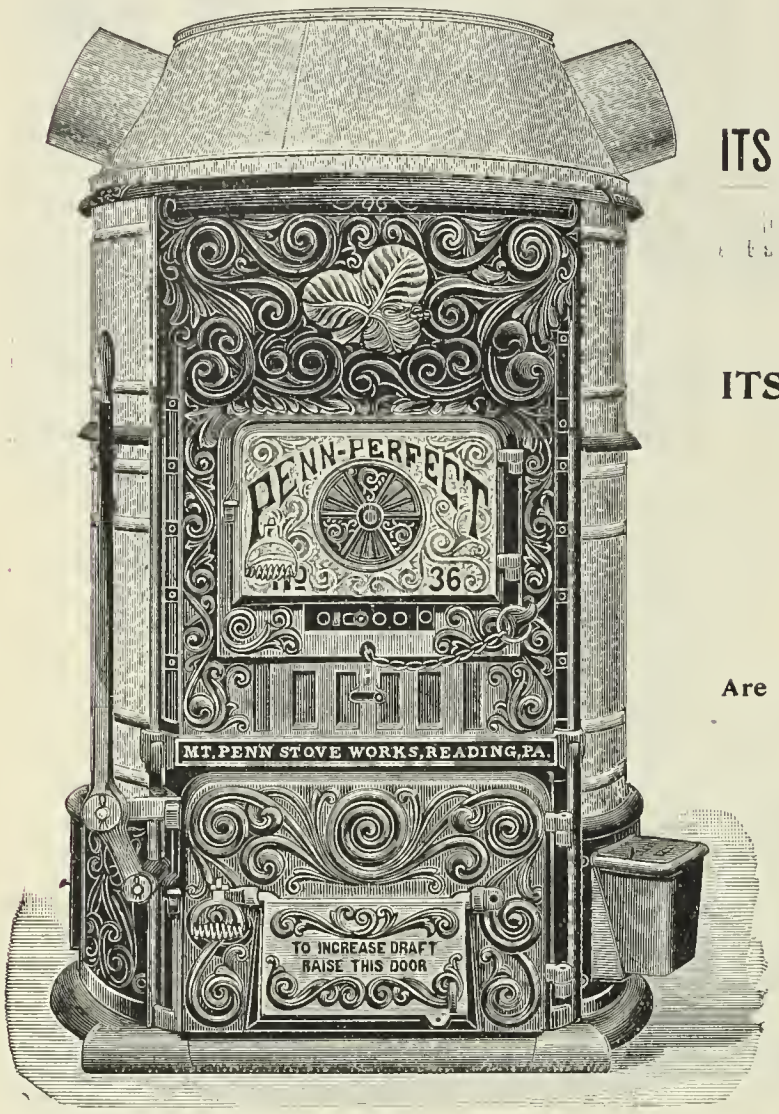
☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

TUBULAR HEATING AND VENTILATING CO.,

228 QUARRY STREET, PHILADELPHIA.

The PENN PERFECT



IS A FURNACE WELL WORTHY OF ITS NAME.

ITS BIG VALUE

IS EASILY SEEN AND UNDERSTOOD.

ITS Massive Ornamental Front,
Perfect Grate, Large Ash Pit,
Automatic Check Draft Damper,
OXYGEN BURNER,
Sectional Fire Pot, and
Large Vapor Pan

Are Special Features which make the Furnace particularly attractive to a customer.

MT. PENN STOVES & RANGES READING PA.

It Burns Any Kind of Fuel.

The phenomenal success attending its introduction early last year, and the lively demand it has met since it was introduced, prove conclusively that it is

A GOOD SELLER.

IT IS MADE IN SIX SIZES.

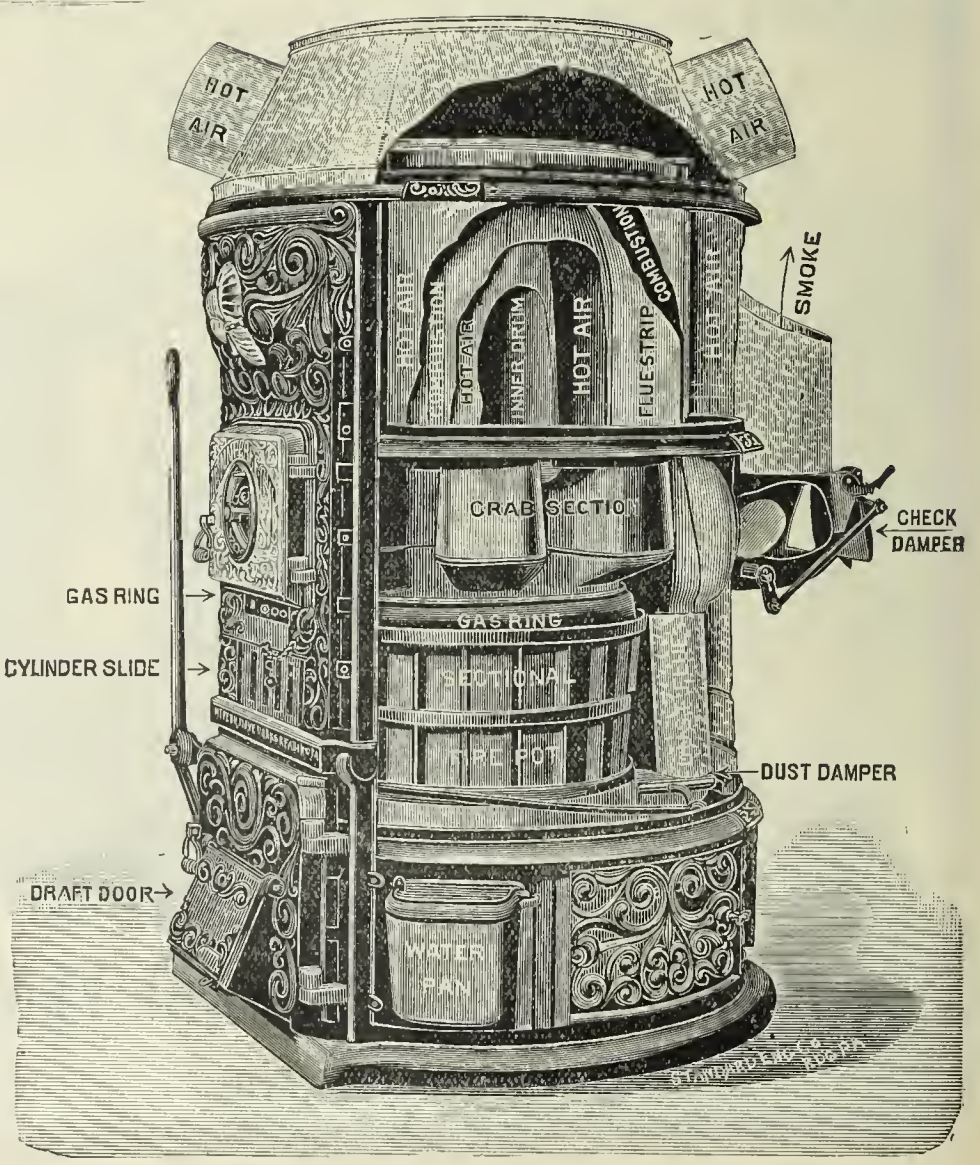
☞ **We should like you to have more particulars in regard to this furnace. We have a little pamphlet describing it, which will be mailed on receipt of a postal from you.**

THE

Mt. Penn Stove Wks.,

READING, PA.

Philadelphia Store, 111-113 N. 2d St.



The Only Round Oak!

Superior to any Heating Stove in the World!

And it has no—"Ash Pan."

For 20 years the eminent Stove Makers have endeavored to account for its phenomenal success—without an—"ASH PAN."

For 20 years they have fought it—"tooth and nail"—"fair and foul"—"it could not succeed," "it had no ash pan."

It is succeeding fairly well—thank you—its sales are nearly—one-third—the entire output of—Oaks—and growing.

It still leads the way—without an "ash pan" and provides—fame—and a—name—for—counterfeits—to trade upon—safely inside the law.

***GREAT* is the only—Round Oak!**

Originated and made famous by

Beckwith,
Dowagiac.

Peerless Andes.

Entirely New. *Finest Range Ever Made.*

WE present the latest addition to the ANDES line of Stoves and Ranges. As will be noticed from the above cut, the design is bold, up to date, and strictly correct, artistically considered. This range is unusually large in every way. It has every improvement which is at all desirable. The oven is very large and well ventilated; heated on five sides The ash pan is unusually large. The fire box is a new and improved form, perfect in its fittings. The grate is of our own improved style of draw out form, together with our own patent arrangement for taking out the single bars without removing the fire box. The entire grate can be drawn out without removing the fire box. The wood fixtures for this range we claim to be better than any heretofore made. The reservoir is unusually large. The oven door, as is shown in the above cut, has the best form of oven thermometer made. The top oven plate is cemented. The bottom of the stove is double. The back of the oven is double. An elegant nickel band on the edge of main top, and also on the edge of high shelf. Reed's patent check damper. Towel rod. Elegant plate panels. In every respect this range is as good in design, form, weight, quality of castings and mounting as can possibly be made. The prices will be right.

Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

The Radiant Andes.

Entirely New. Medium Price.

ELEGANT Plated Trimmings, Handsome, Attractive, Large Sizes, Large Pan, Heavy Pots, Heavy Stoves, Well Made, Durable Stove, Good Hot Air Flue. Every Stove a Double Heater, Duplex or Draw Centre Grate.

Two sizes, No. 13, 13-inch Fire Pot.
" 15, 15 " " "

An important addition to the Andes Line, a handsome, attractive, well made stove, very heavy pots, durable in all parts; it is made to suit the times. Prices are right and will interest the buyer.

Oak Andes.

EVERY manufacturer claims he has the *BEST OAK STOVE.* Every buyer wants the *BEST OAK STOVE,* and without the least fear of contradiction we offer to the trade the

OAK ANDES as the best BEST OAK STOVE.

It has the *BEST AIR TIGHT JOINTLESS BOTTOM,* the *BEST AIR TIGHT REGISTER DAMPER,* the *HEAVIEST FIRE POT,* the *HANDSOMEST DESIGN* and the *BEST WORKMANSHIP* of any stove on the market.

It is beyond question an *AIR TIGHT STOVE.*

The sales for 1896 were four times as large as the manufacturers expected and the indications are now that the capacity of the works will be severely taxed to meet the demand for the present year. Buyers who wish the best should secure agency at once.

Phillips & Clark Stove Co.,

Geneva, New York.

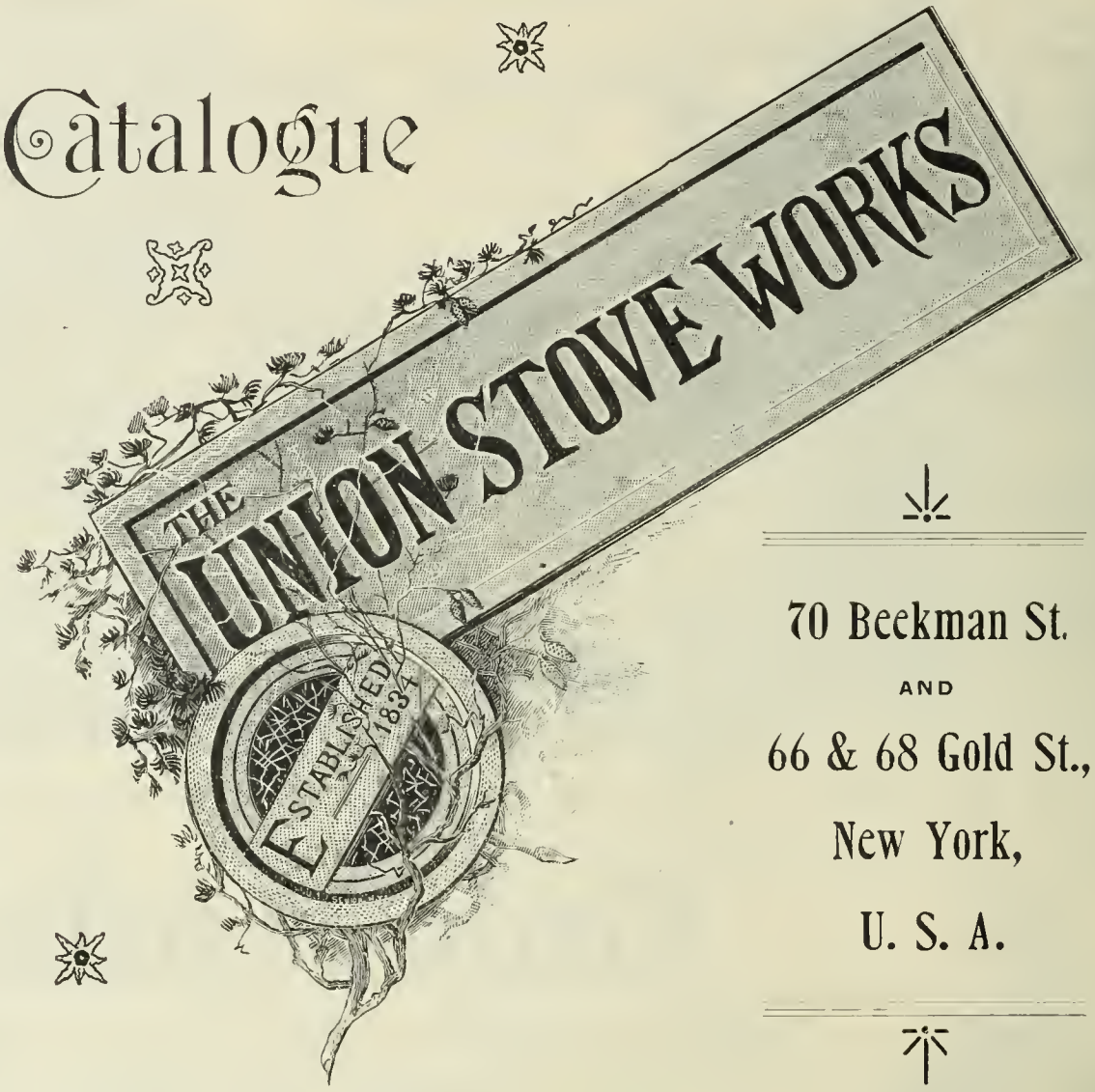
EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

1897

WITH SUPPLEMENT.

Catalogue



70 Beekman St.
AND
66 & 68 Gold St.,
New York,
U. S. A.

MANUFACTURERS OF

Stoves, Ranges, Heaters,

GAS RANGES AND APPLIANCES,

ETC., ETC.,

We present a fac-simile of the cover to our ***161-page*** Catalogue, every page of which is teeming with interest ***for you.***

The ***immense*** variety of ***Stoves, Ranges, Fire Place Heaters, Furnaces, Laundry Stoves, Gas and Oil Appliances,*** is too great for special mention here.

Won't you become acquainted with its contents by sending for a copy?

THE UNION STOVE WORKS,

70 Beekman and 66 & 68 Gold Sts., New York City.

Does it pay

To sell some old moss-covered pattern just because you have sold it for a number of years? It may have been very popular in its day, but if not kept up to date you cannot afford to give it space in your showroom.

Does it pay to try to sell a line of stoves and ranges that does not give you variety? We think you will admit *it does not pay*, especially when you can buy a line of stoves and ranges that will give you the variety you need, and special patterns exactly suited to your wants at that. This line is the

ACORN

and it is the only line made that will give you variety, bright new patterns, and low prices; prices that cannot be duplicated by anything approaching in excellence the magnificent goods we have to offer. We can easily demonstrate to you that you are losing money by not selling *Acorns* if you will give us the opportunity.

Rathbone, Sard & Co.

ALBANY. CHICAGO. DETROIT.

Eastern foundries, - Albany, N. Y.
Western foundries, - - Aurora, Ills.

"Front=Flue

Have you
agency of the
FRONT-
BASE-H
Oak Stove in
Heating
and one-third
than any dire
Stove.

A genuine
success.

The Michigan S

Largest Makers of Sto
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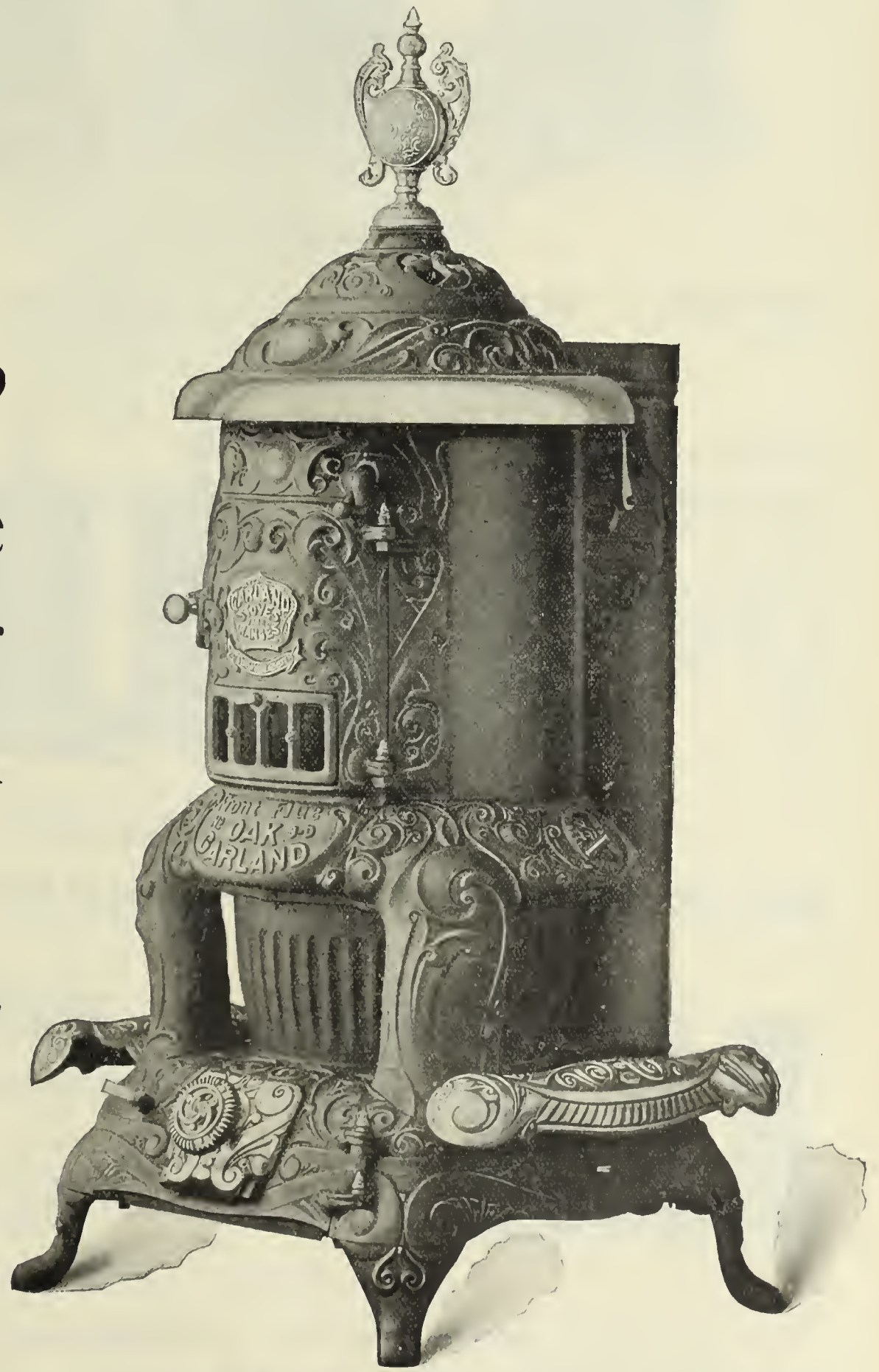
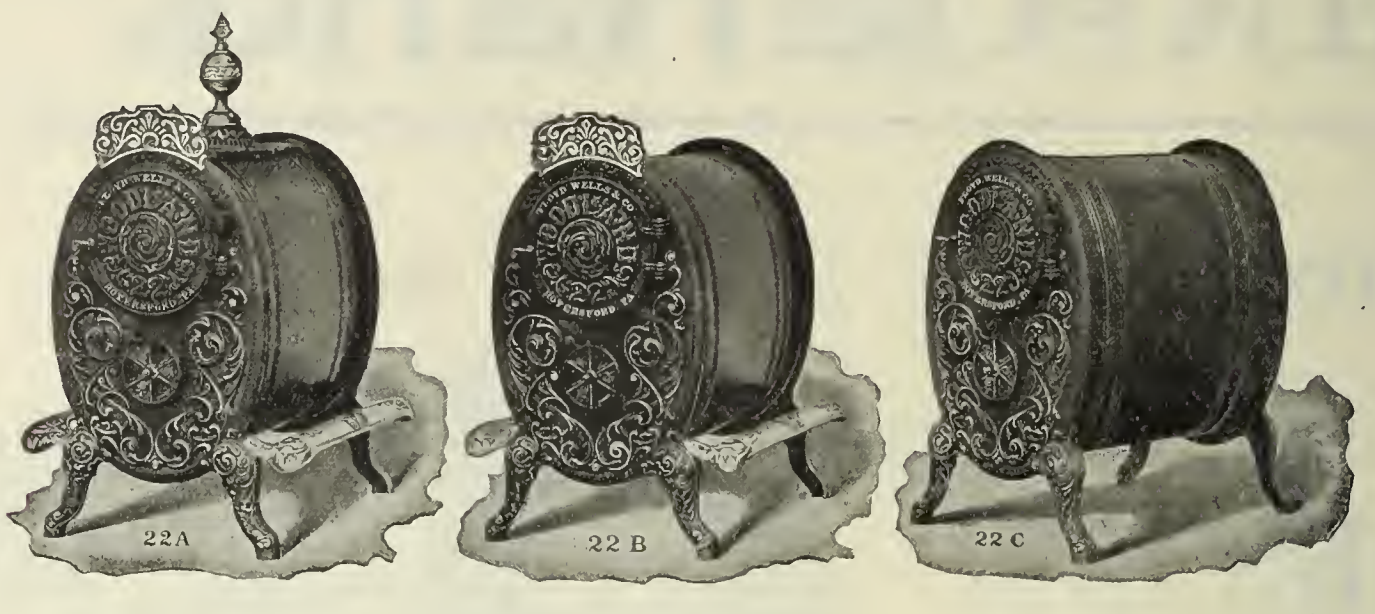


BUFFALO.

THREE SPECIAL MONEY-MAKERS.



Woodland.

ENTIRELY NEW. **IT LEADS THEM ALL.**

Thousands of these booked for this fall's trade, and still they come.

Driftwood and Elmwood Air-Tights.

THE BEST AND MOST POPULAR MADE.

ROSEMONT RADIATORS.

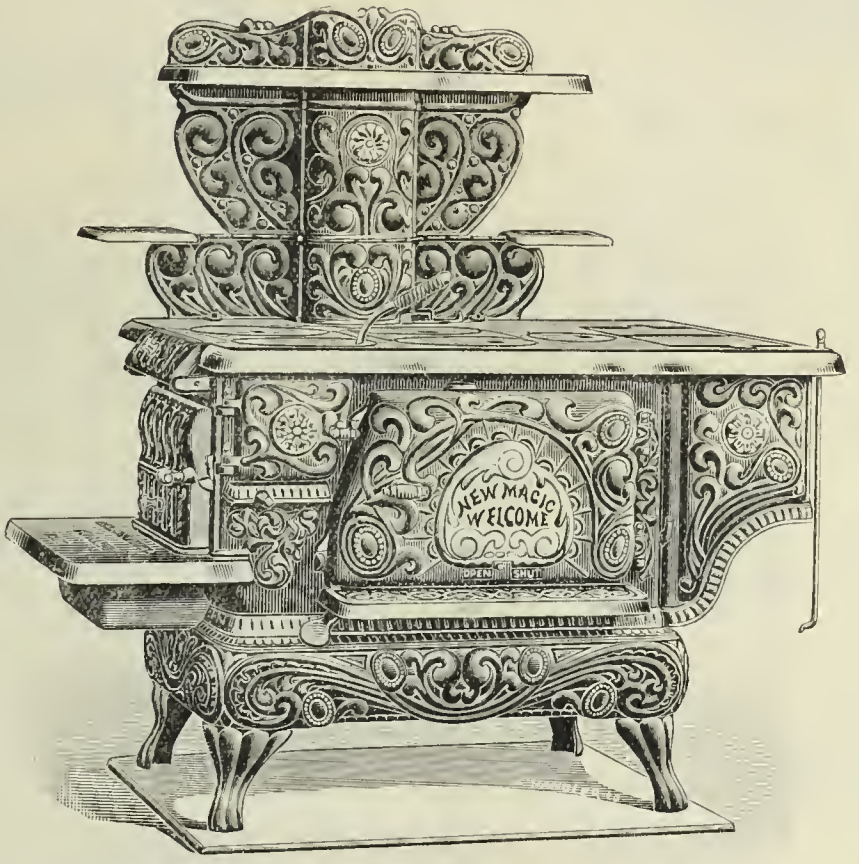
None Better. None So Good.

SAVE TIME,
SAVE FUEL,
SAVE WARMTH,
SAVE MONEY.

WRITE FOR FULL PARTICULARS.

FLOYD, WELLS & CO., Royersford, Pa.

WELCOME STOVES AND RANGES.



NEW MAGIC WELCOME RANGE.

When we presented to the trade five years ago our Magic Welcome Range we predicted it would create a sensation. Note the result. We have sold more than ten thousand Magic Welcome Ranges and the demand increases. Our New Magic Welcome Range will prove a worthy member of our growing family. Will the progressive dealer who has not secured the sale of a Bread-winner, write us for terms and prices? Address

Syracuse Stove Works,

SYRACUSE, N. Y.

Western Agents,
A. J. LINDEMANN & HOVERSON CO.
MILWAUKEE, WIS.

New York Office,
105 BEEKMAN STREET.

WOOD OVAL—AIR TIGHT.

With Nickel Ornamental Top. A STOVE FOR BURNING WOOD.

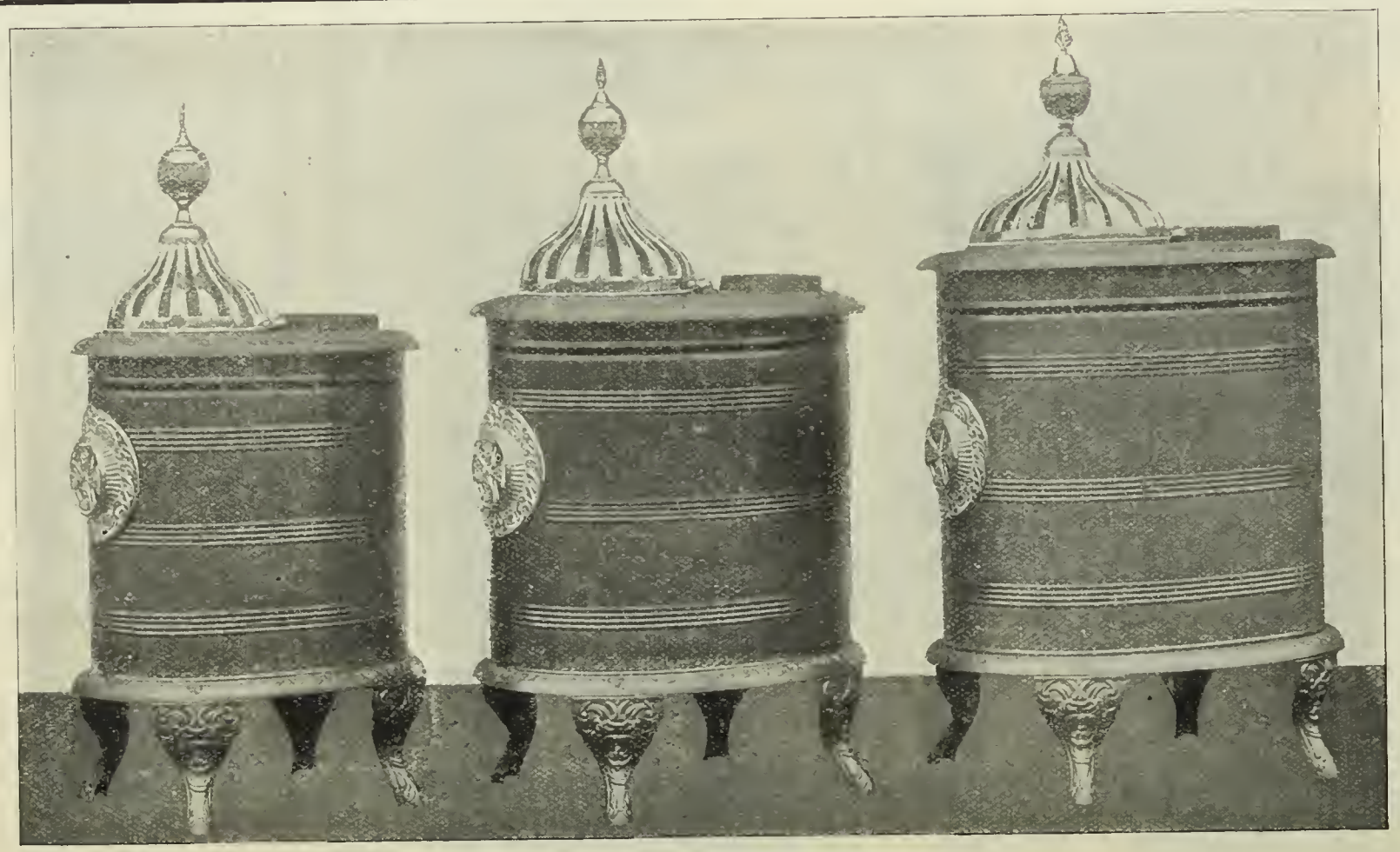
Al joints . re absolutely air and water tight and the appearance of creosote deposits entirely prevented. Draft alway s under p rfect control.

These stoves finished in **Polished Steel ; lined with sheet steel, securely held at top and bottom. Inside bodies made of extra heavy iron. Inside rods covered with lap-weld iron pipe.**

Nickel Swing Cover and Urn

Nickel Register and Frame

The Feet are held by Bolts.

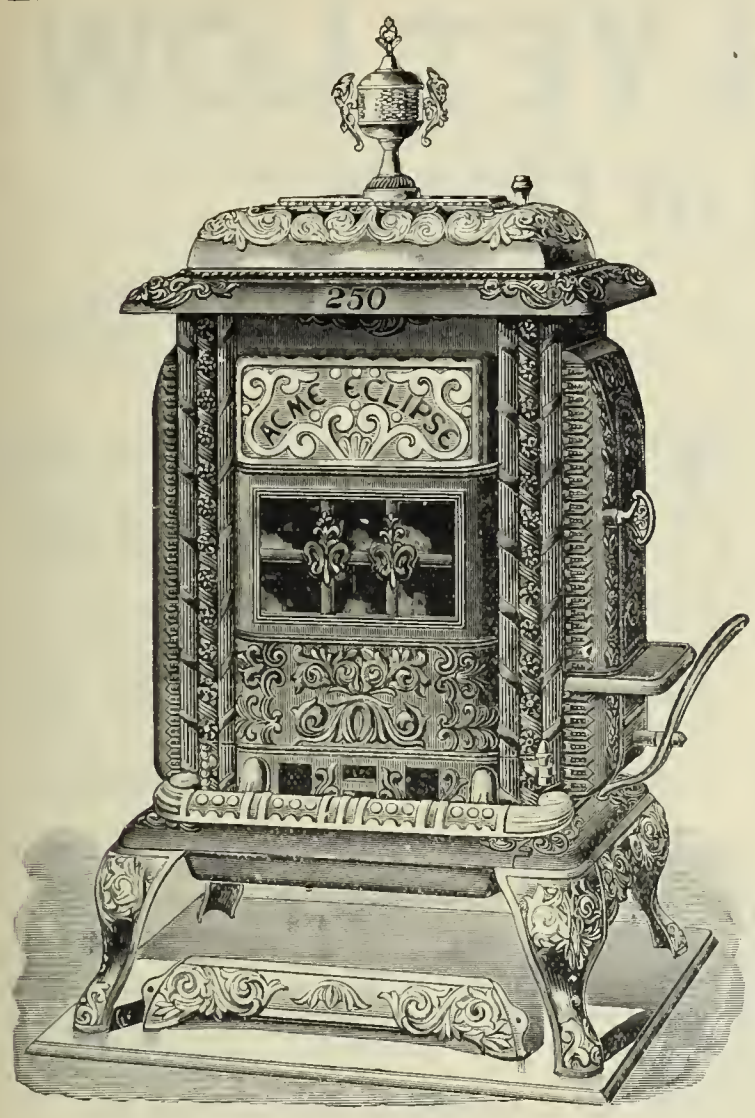


NICKEL ORNAMENTAL TOP. U. S. STEEL.

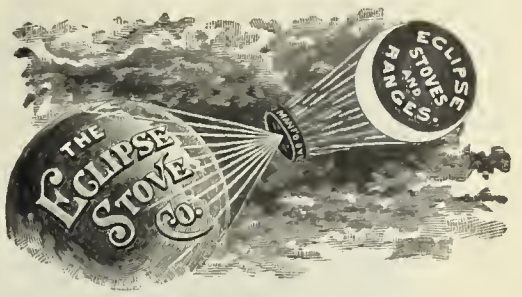
No. 19.....19-inch wood. *No. 21.....21-inch wood.* *No. 23.....23-inch wood.* *No. 25.....25-inch wood.*

Also furnished with collar in rear. Sweat damper with each stove if desired.

THE MARCH-BROWNBACK STOVE COMPANY, Pottstown, Pa.



EVERY STOVE WARRANTED.



Acme Eclipse.

DIRECT DRAFT and DIVING FLUE

Wood Heater.

TWO SIZES.

Juno Eclipse.

DIRECT DRAFT and DIVING FLUE

Coal Heater.

(Same Design as "Acme.")

TWO SIZES.

Write for our **New Catalogue,** showing Line complete, with many important and attractive additions for '97.

The Eclipse Stove Co.,

MANSFIELD, OHIO.

SHOWING DIVING FLUE.

REPOSITORIES: For Minnesota, No. Dakota and So Dakota:—MINNEAPOLIS, MINN., H. E. COOK, Mgr., No. 208 Nicollet Ave. For Nebraska, Western Iowa and Black Hills:—OMAHA, NEB., OSCAR MILLSAP, Mgr. STREVELL HDW. CO., Agents for State of UTAH.

See our Steel Range Adv. on Page 21.

Clermont Oaks

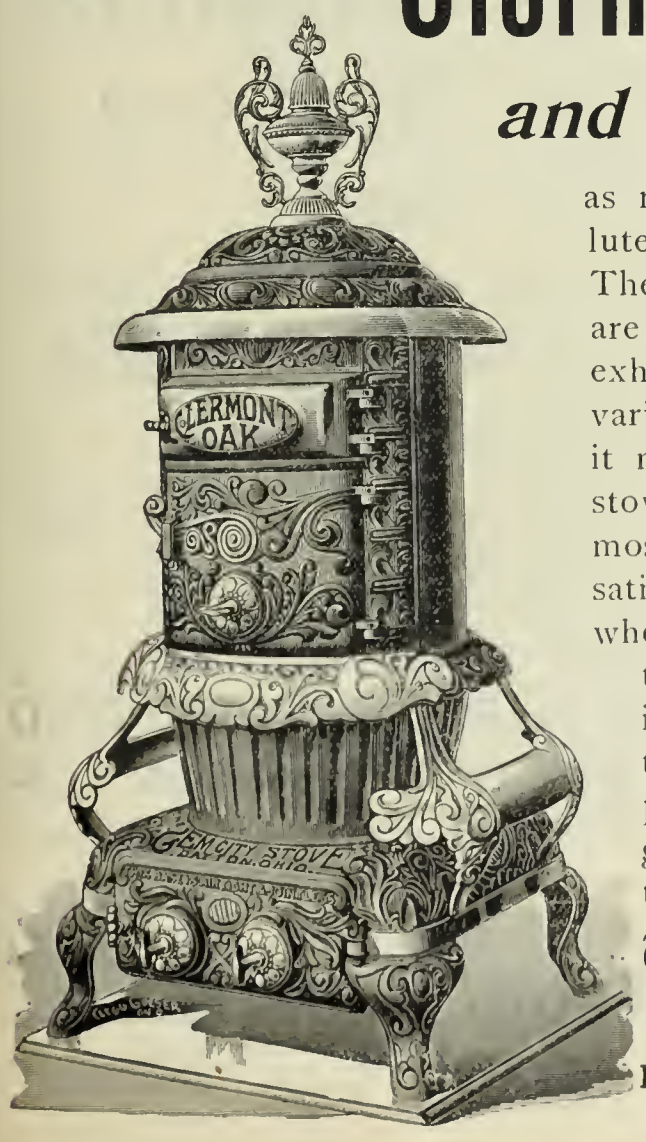
and Air Tights

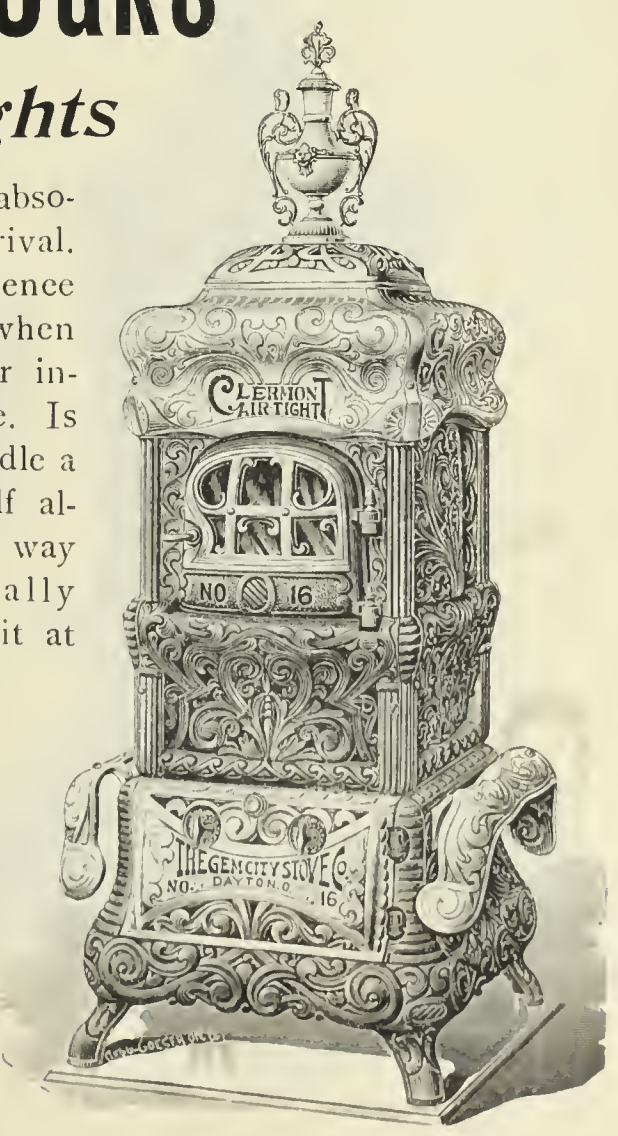
as made by us are absolutely without a rival. Their points of excellence are so manifest that when exhibited the dealer invariably makes a sale. Is it not better to handle a stove that sells itself almost and is in every way satisfactory, especially when you can sell it at the same price as inferior productions? Our complete line is a good one to tie to. Write

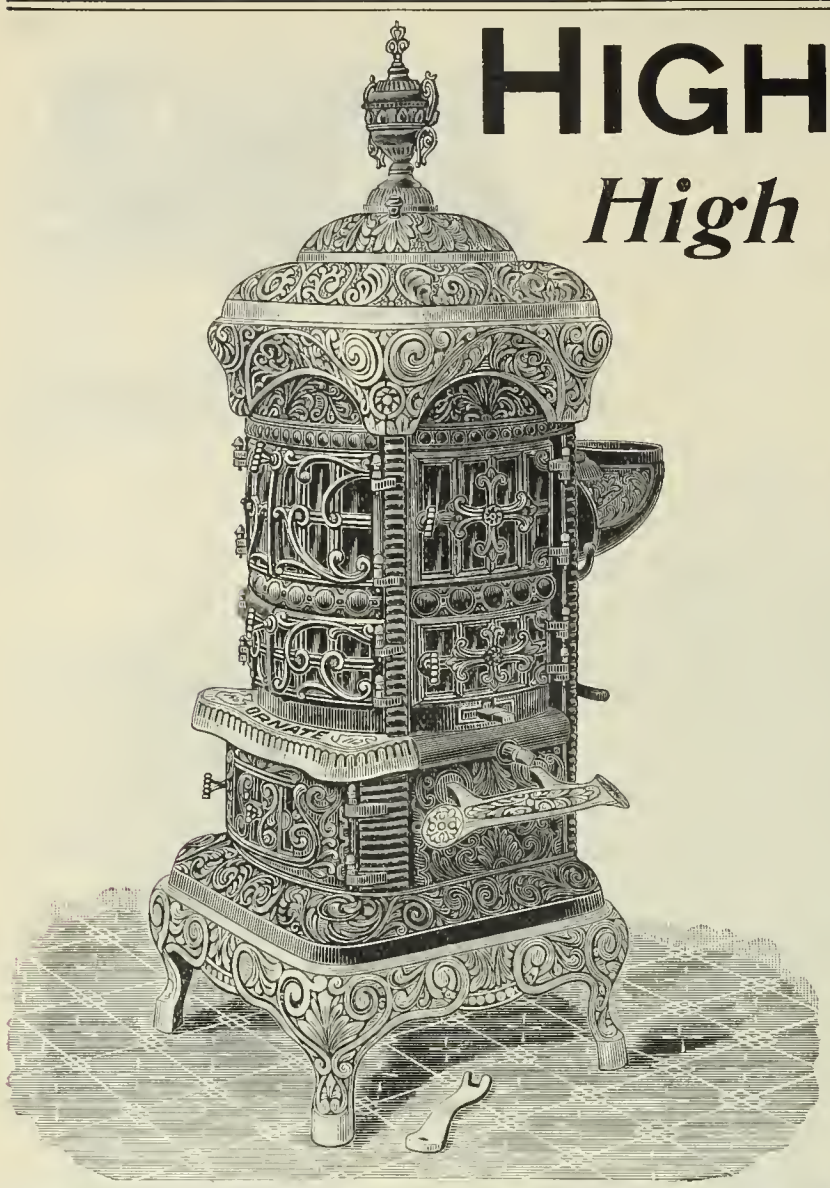
The Gem City Stove Co.,

DAYTON, OHIO,

To-day.







HIGH, YET LOW.

High in Grade,

Low in Price.

IF YOU want a "seller" you need not look beyond this stove---you need only show it and name the price to get the order. If you are in business for "profit" send us a postal for a description and the price of this stove; it will be a cent well invested, as you will find.

SCHUYLKILL VALLEY STOVE CO., - SPRING CITY, PA.

No. 43.—13-inch Fire Pot.
No. 45.—15 " " "
No. 47.—17 " " "

The Royal Elmhurst

FIRST-CLASS BASE BURNER.

Beautiful Ornamentation,

Finest Nickeling (*Silvery White*).

Nickel Dome is Self-Mounting and Ventilated.

AUTOMATIC FEED LID.

HOT-AIR FLUES THROUGH ENTIRE LENGTH OF STOVE, "KITE" FLUE IN BASE.

Duplex Grate and Ball-Bearing Grate Rim.

EVERY STOVE IS A DOUBLE HEATER.

EVERYTHING YOU CAN THINK OF THAT IS GOOD AND NICE IN STOVE CONSTRUCTION IS FOUND IN THIS LINE.

Bergstrom Bros. & Co.,

NEENAH, WIS.

To Rout

"Those Peddlers"

Who threaten to steal your steel range trade by selling from wagons, you need only to fully inform your neighborhood of their methods of doing business and victory is yours. The way to expose these people is to disseminate among your customers the information that

VAN'S NEW PACIFIC

with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal, is the latest, best and handsomest Steel Range ever offered, and that you can offer them terms simply "out of sight" compared with that of the peddler. Try it.

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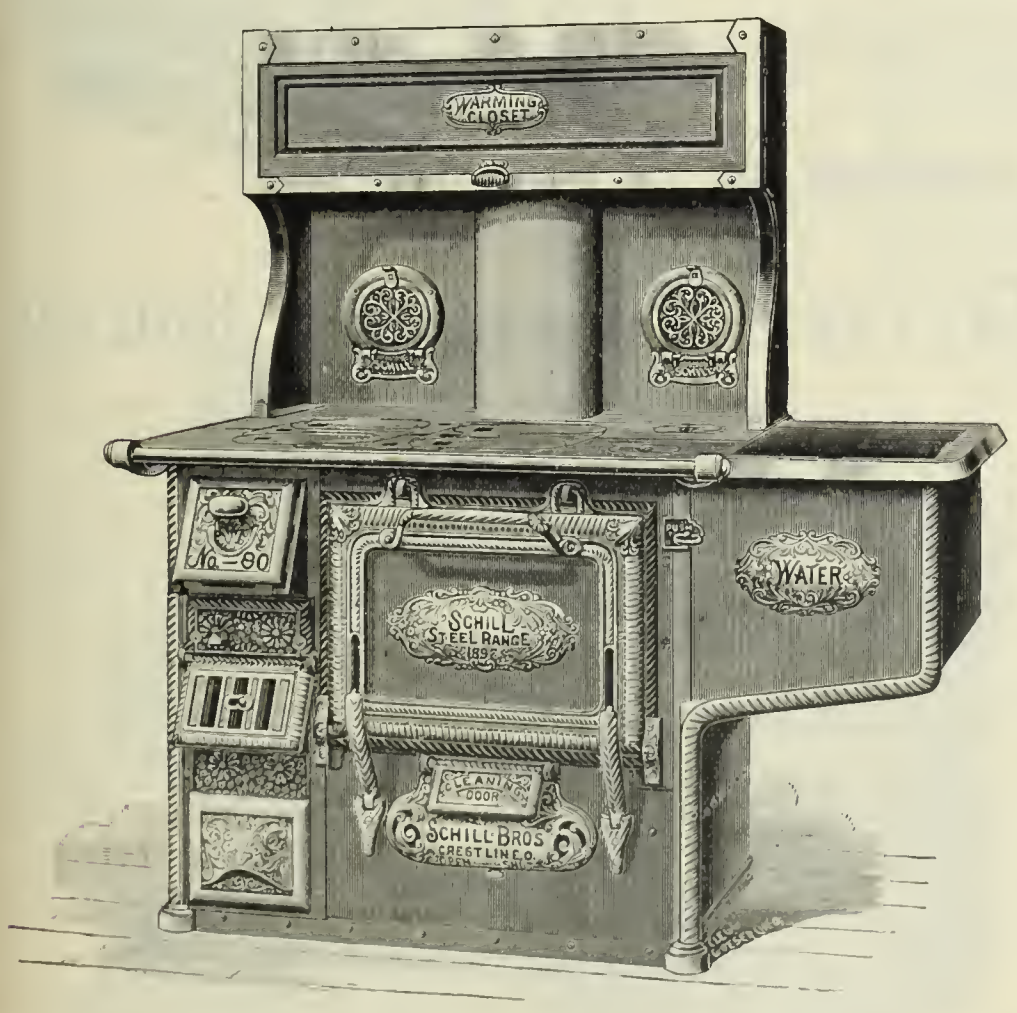

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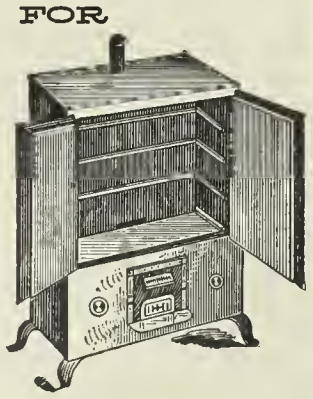

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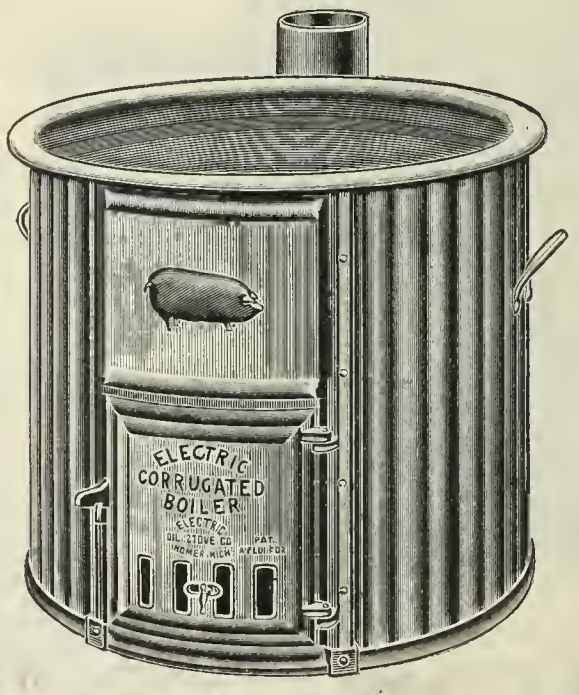

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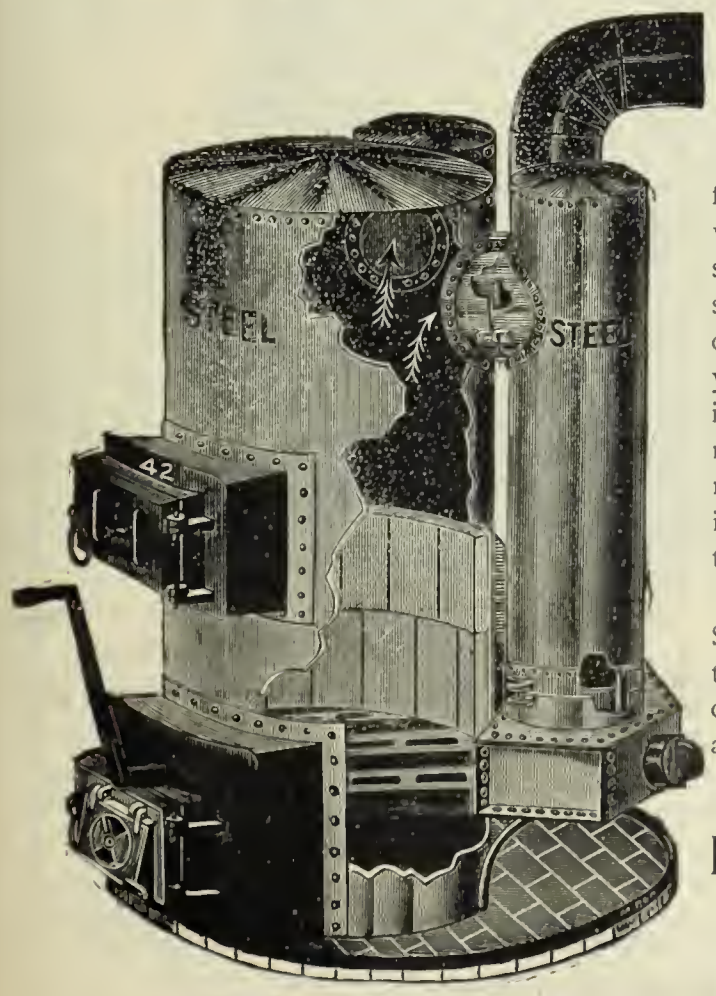

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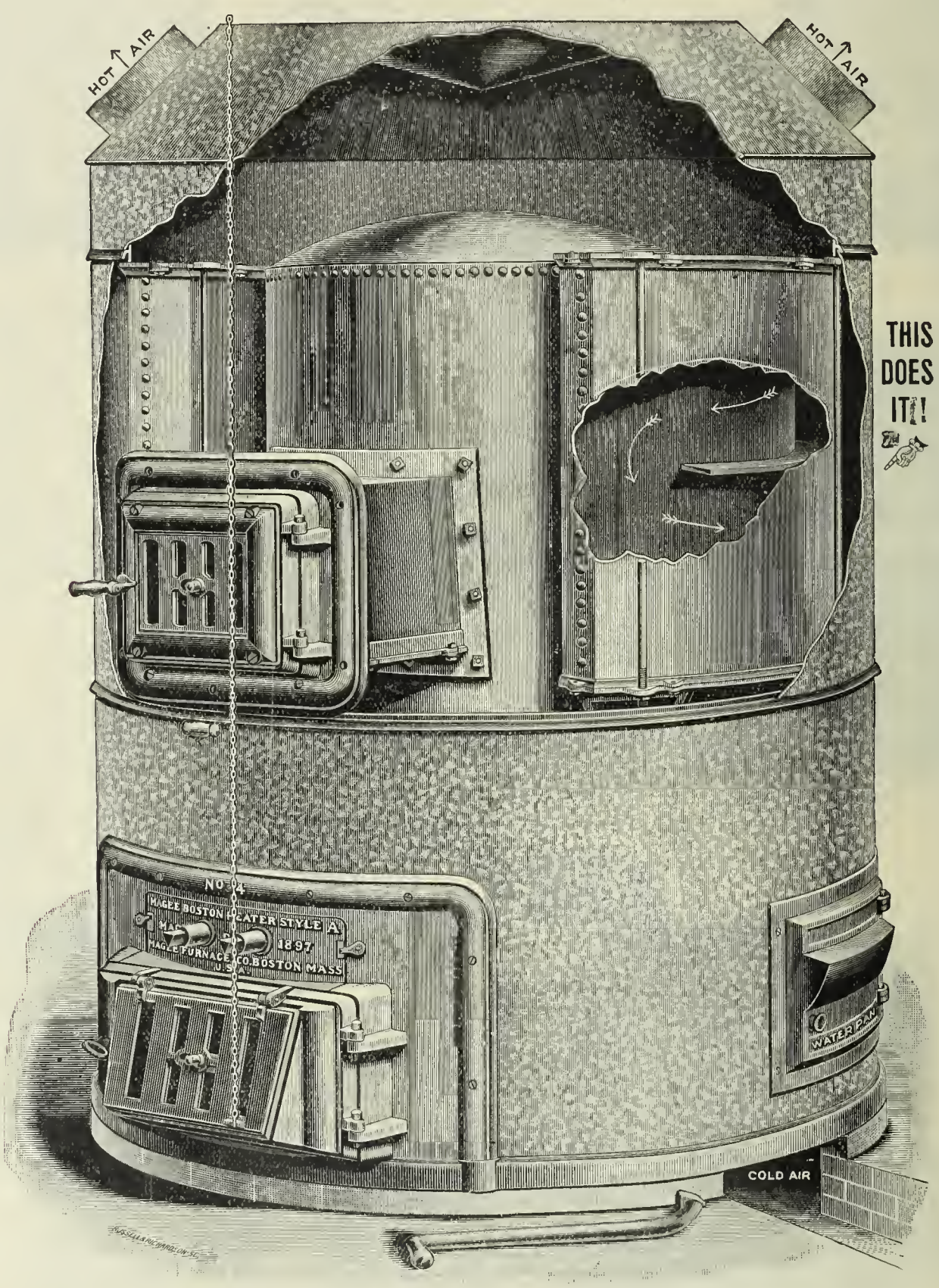

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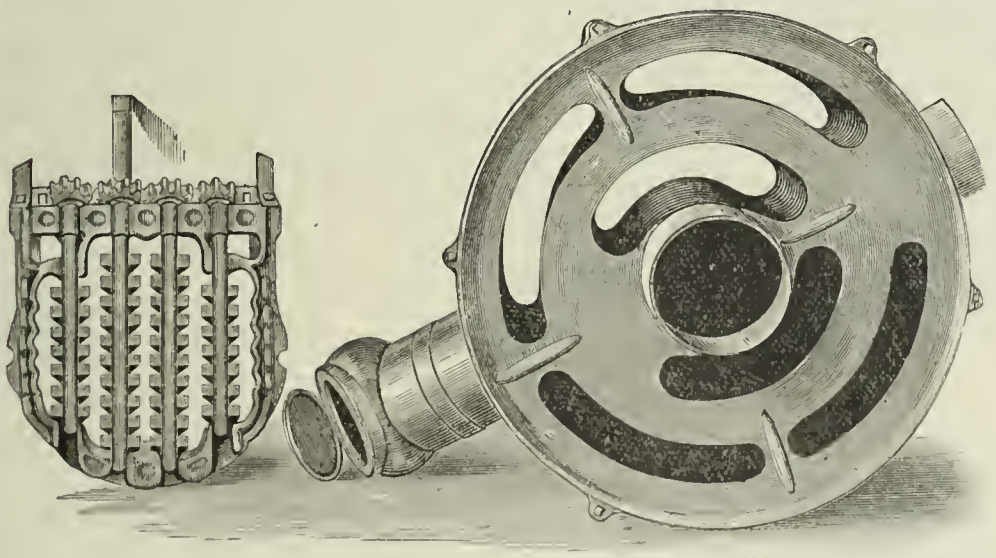

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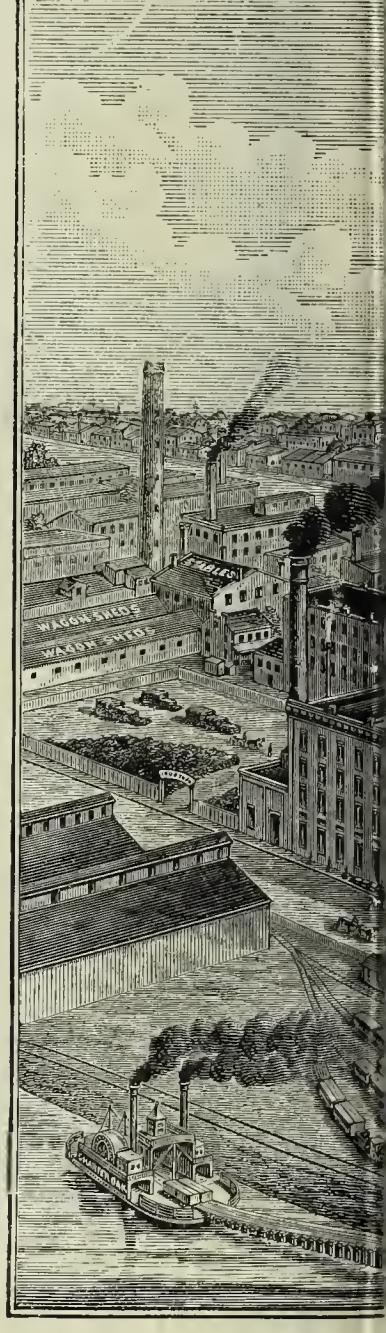

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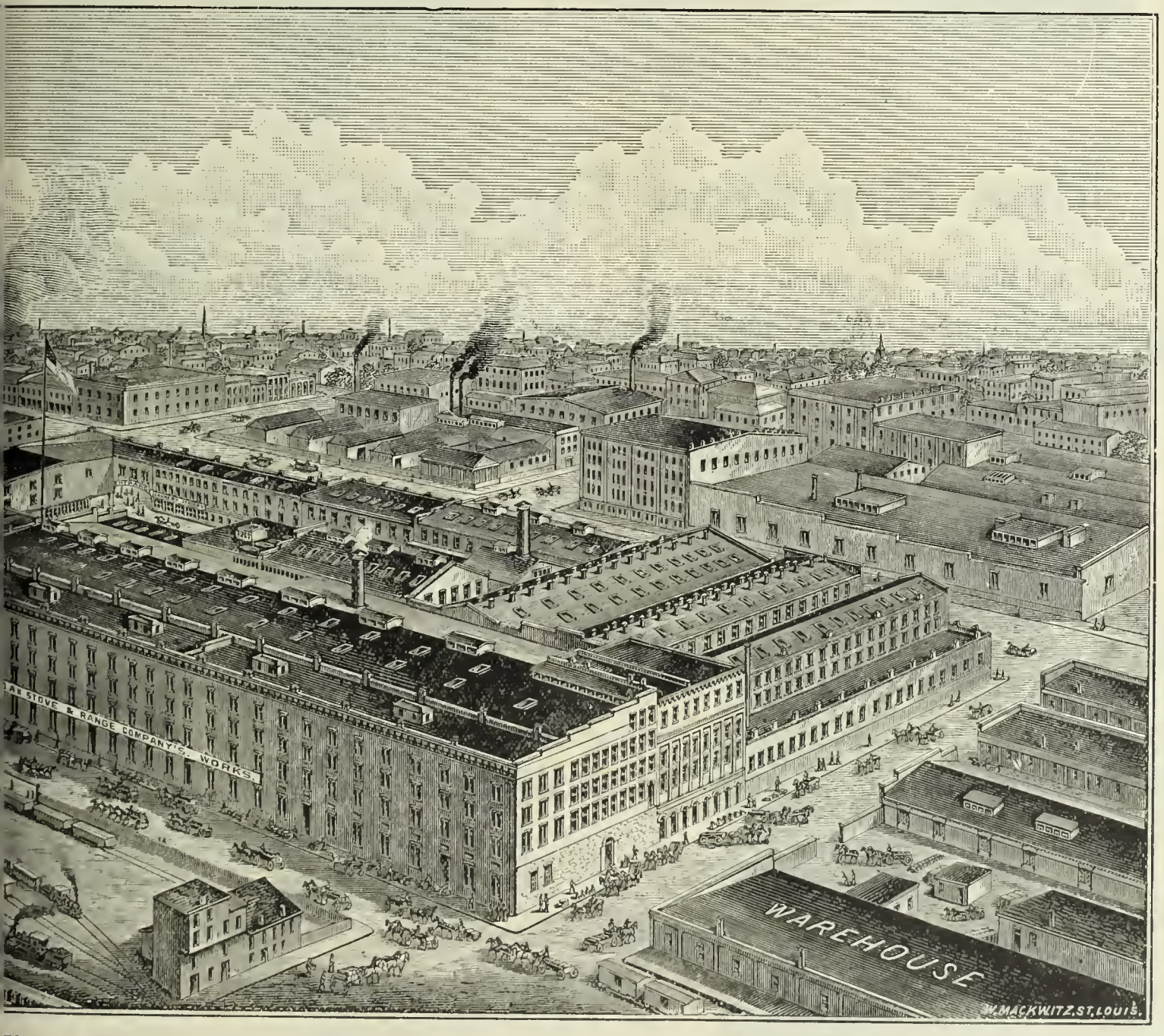

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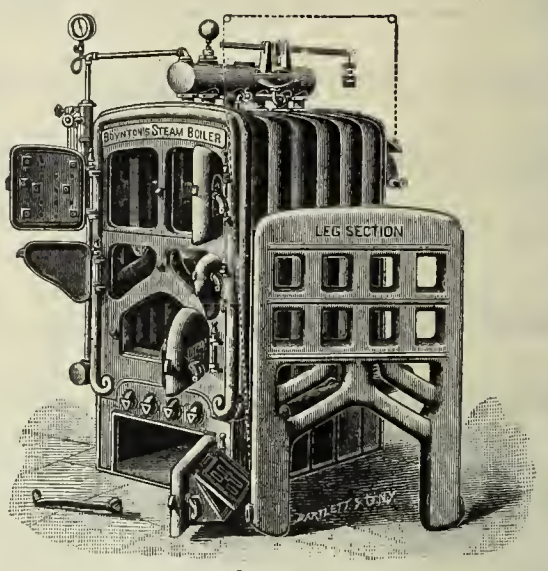

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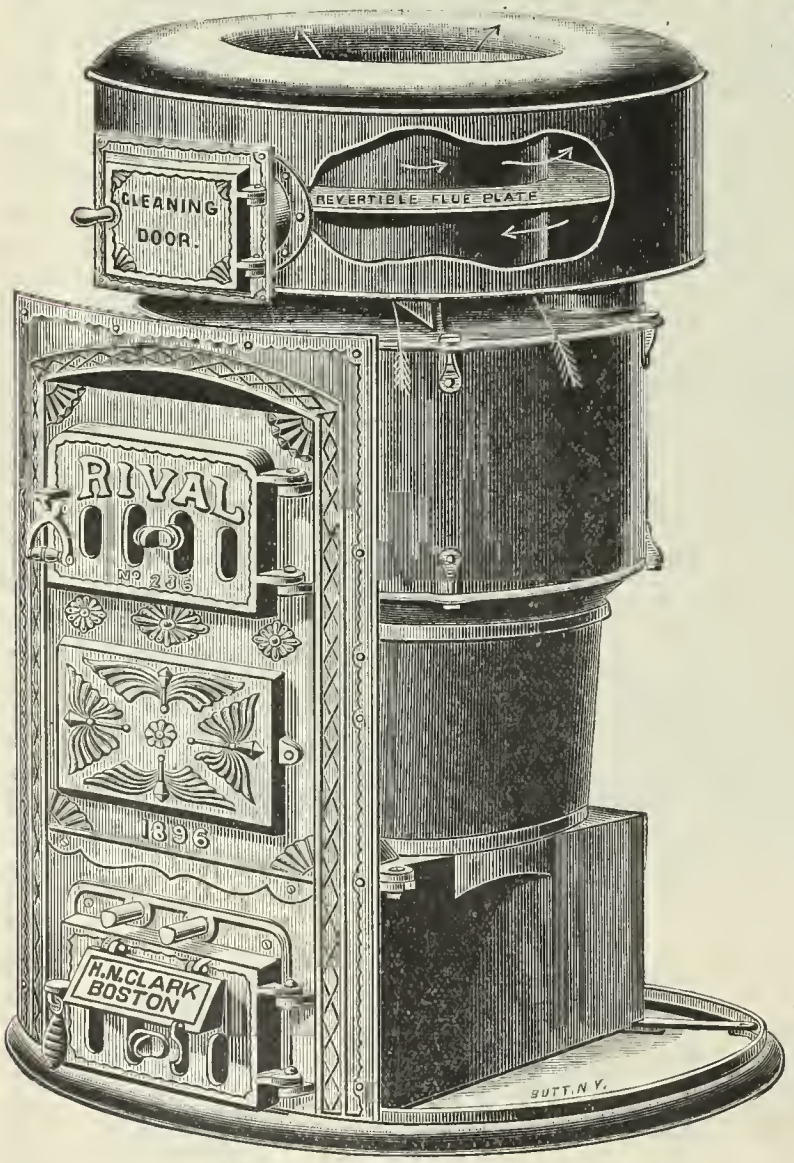

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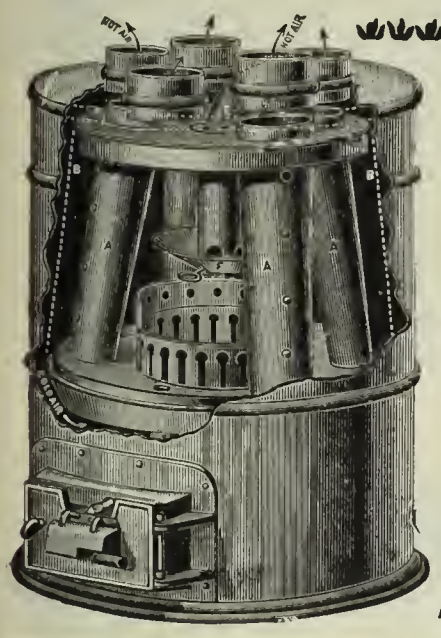

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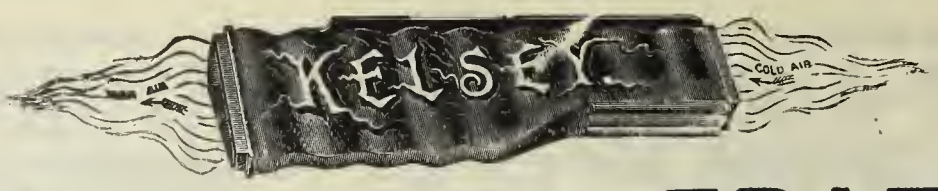

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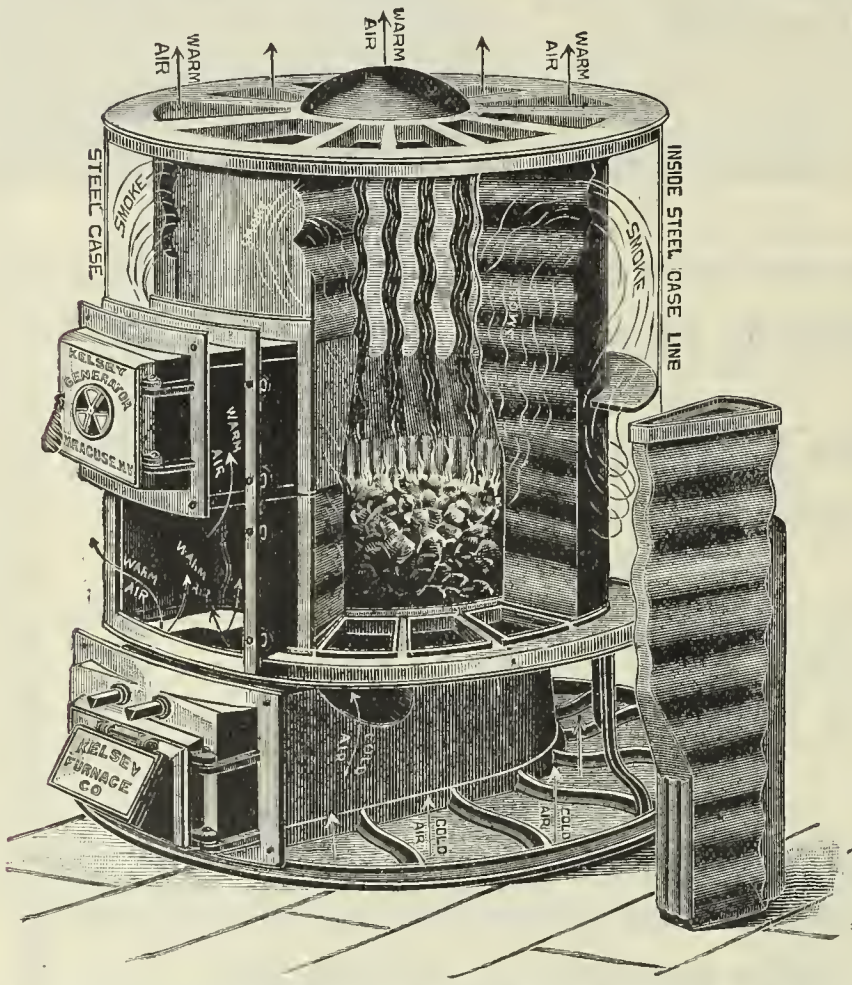

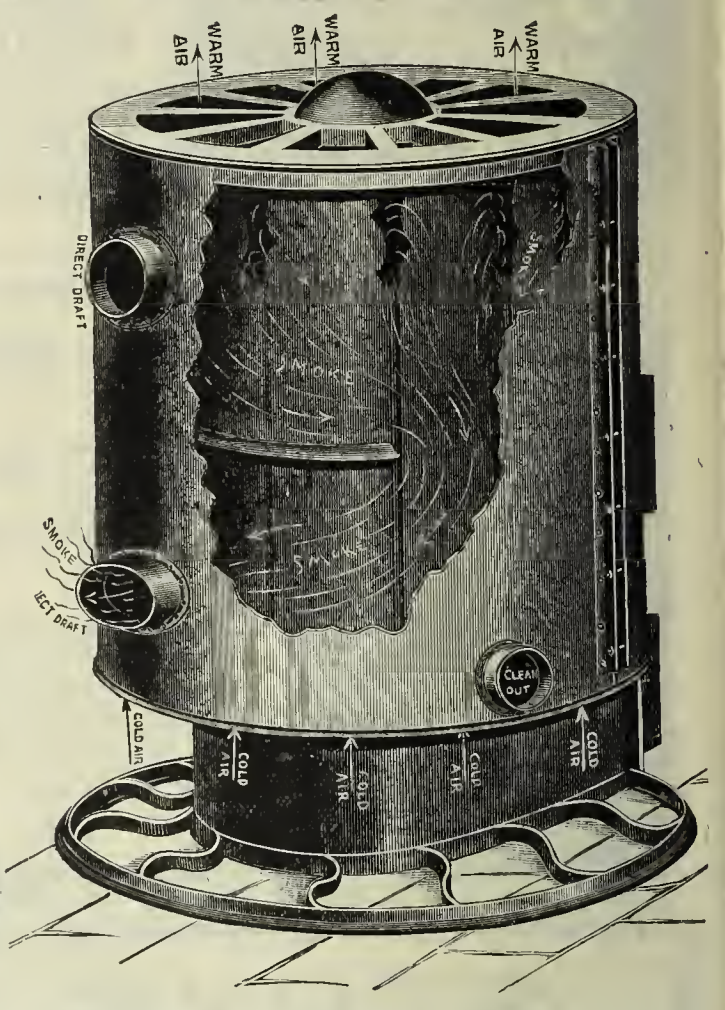

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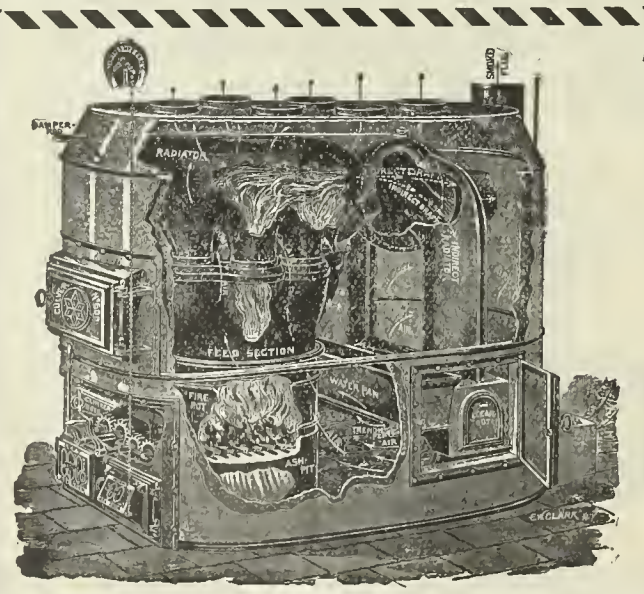

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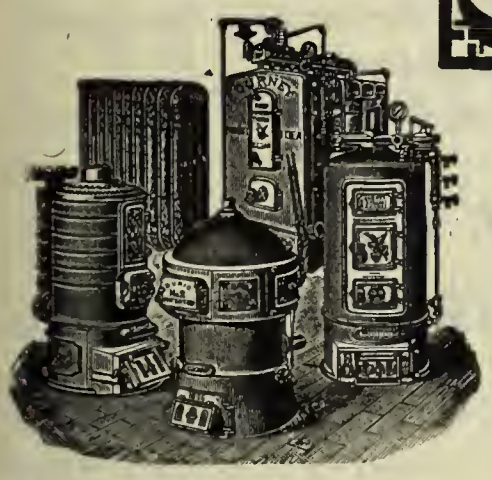

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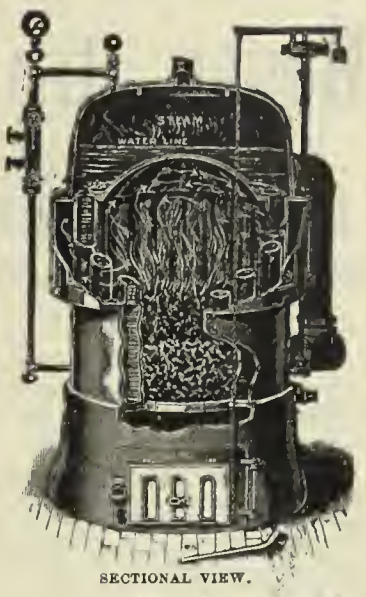

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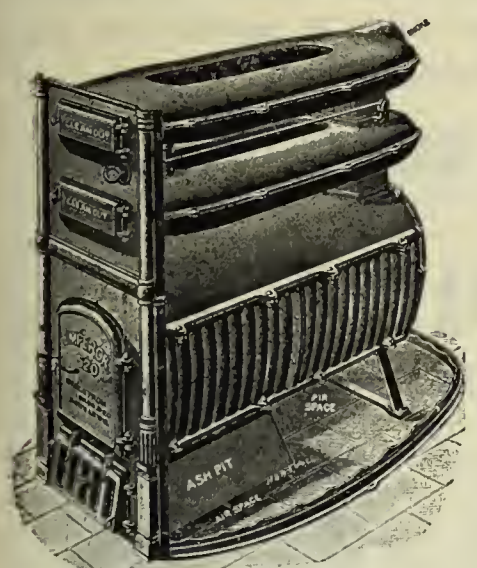

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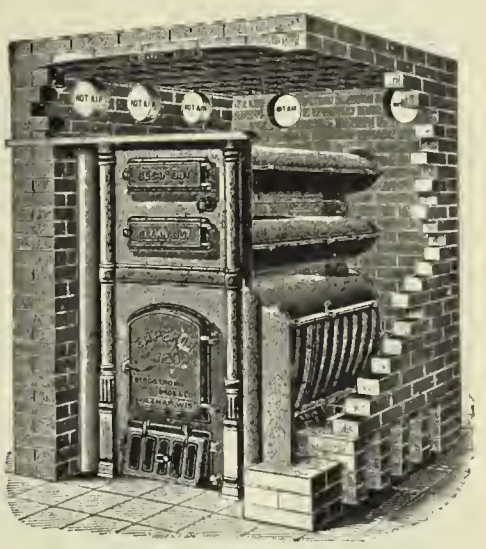

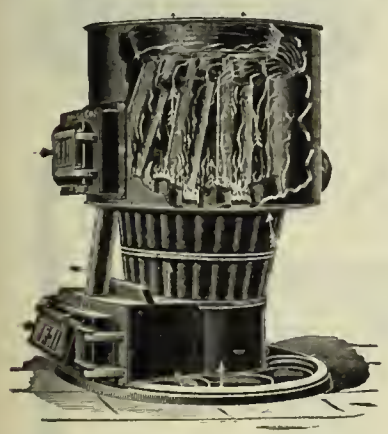

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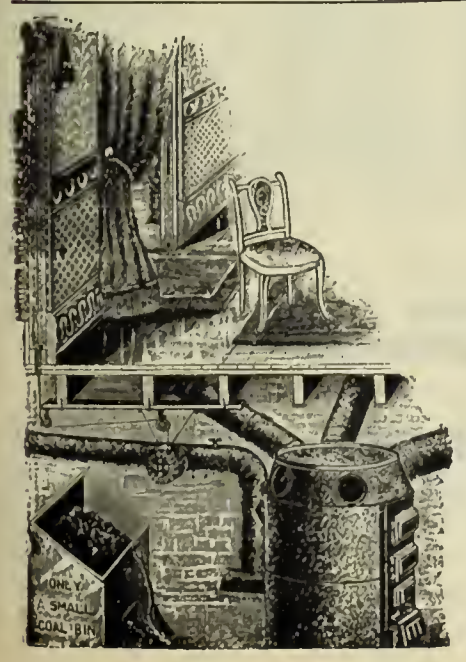

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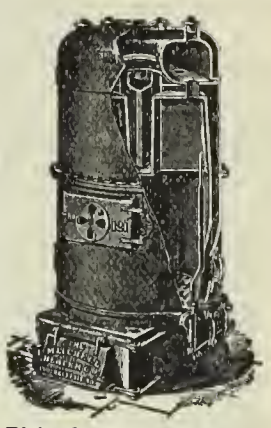

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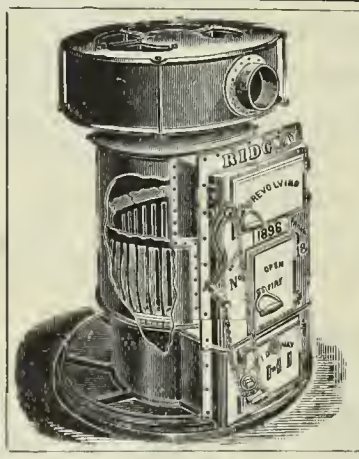

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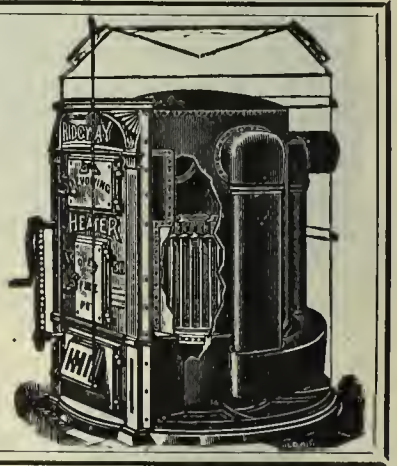

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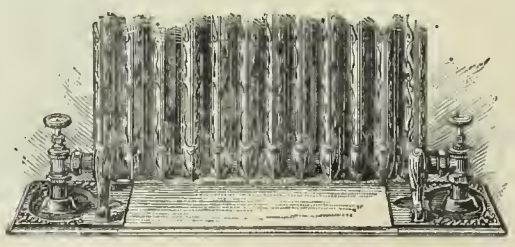

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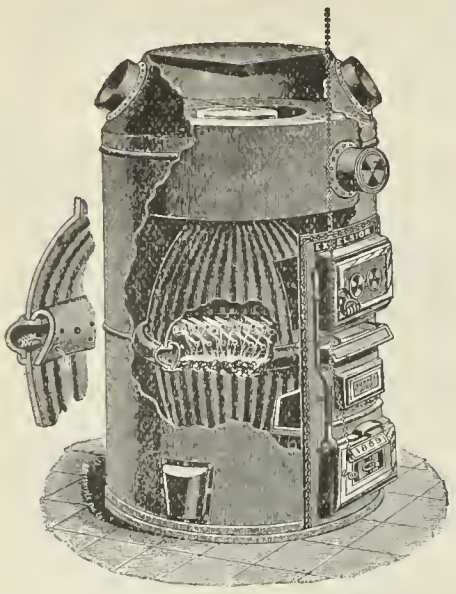

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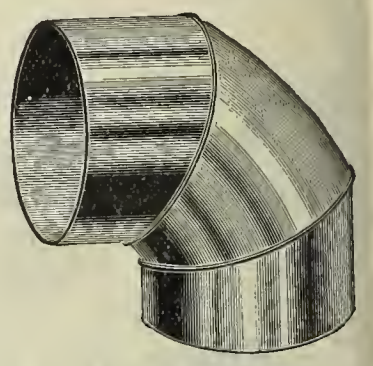

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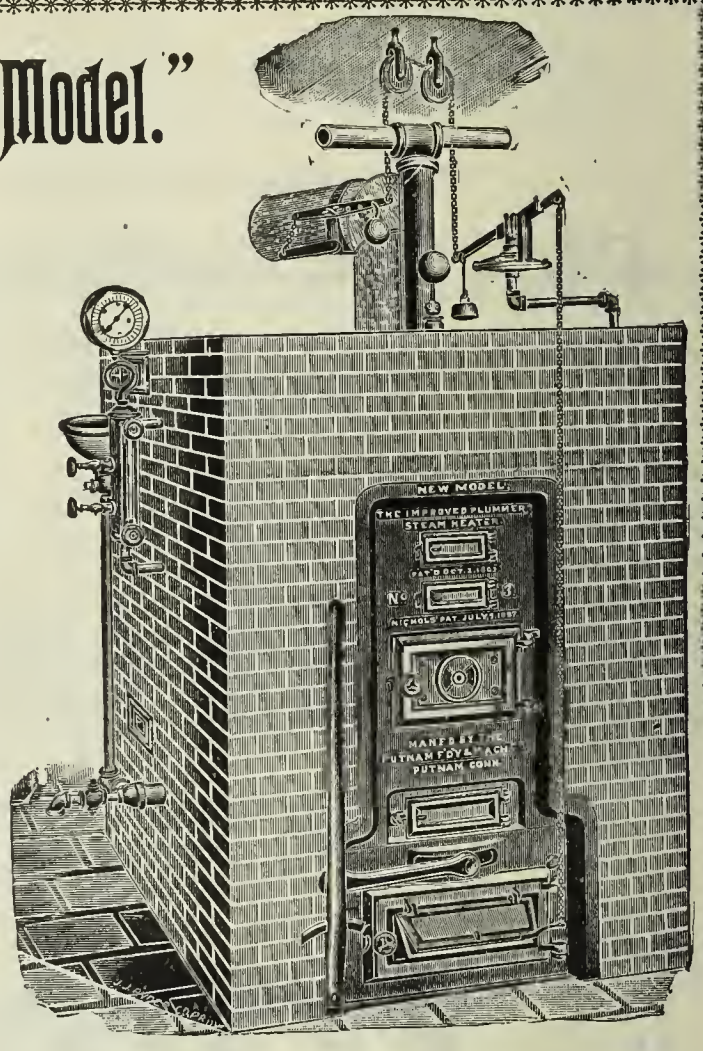

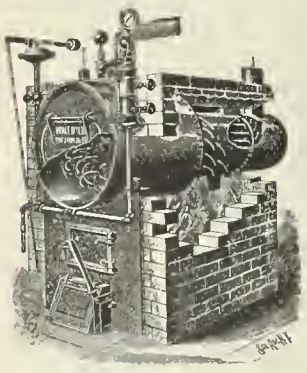

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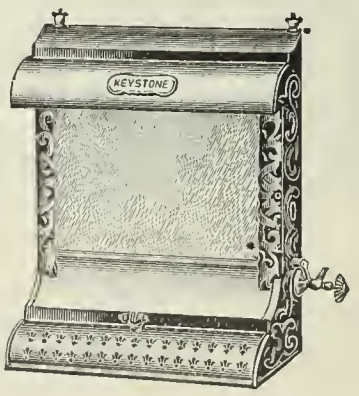

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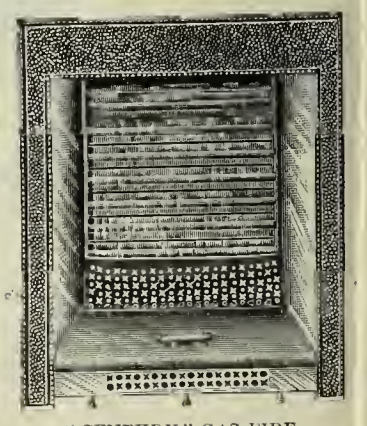

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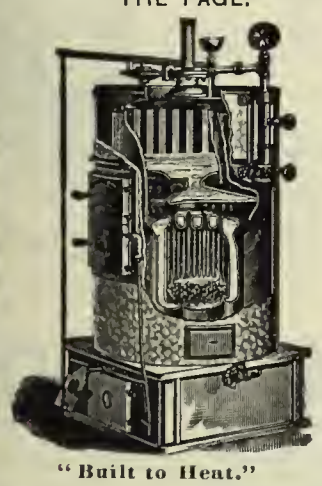

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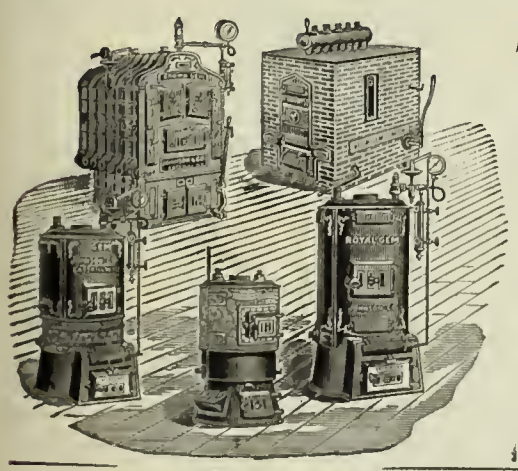

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" 5. Single Pipe Low Pressure Steam Heating.
" 6. Indirect Steam Heating.
" 7. Hot Water Heating.
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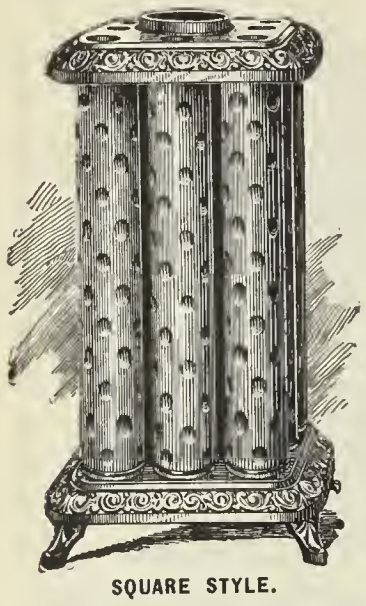

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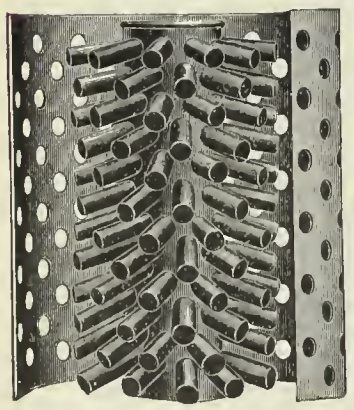

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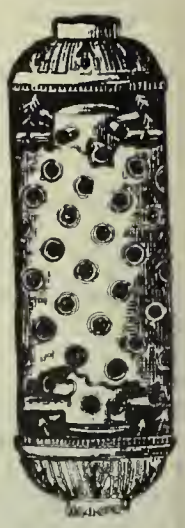

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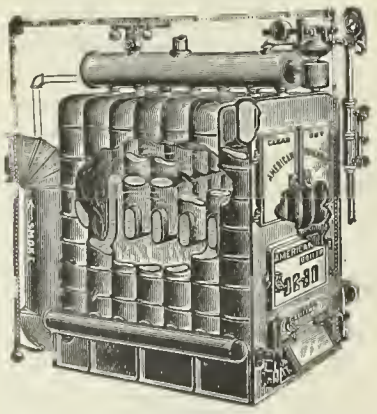

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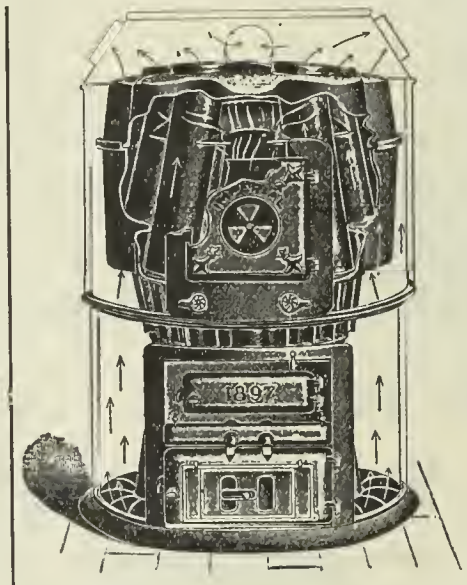

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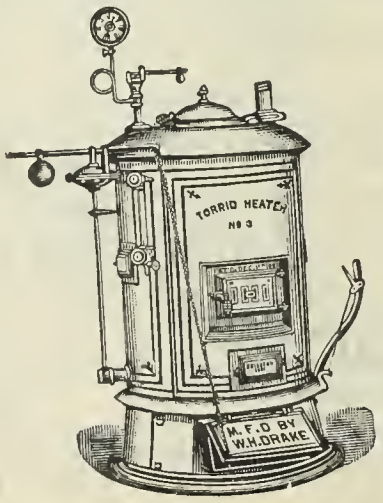

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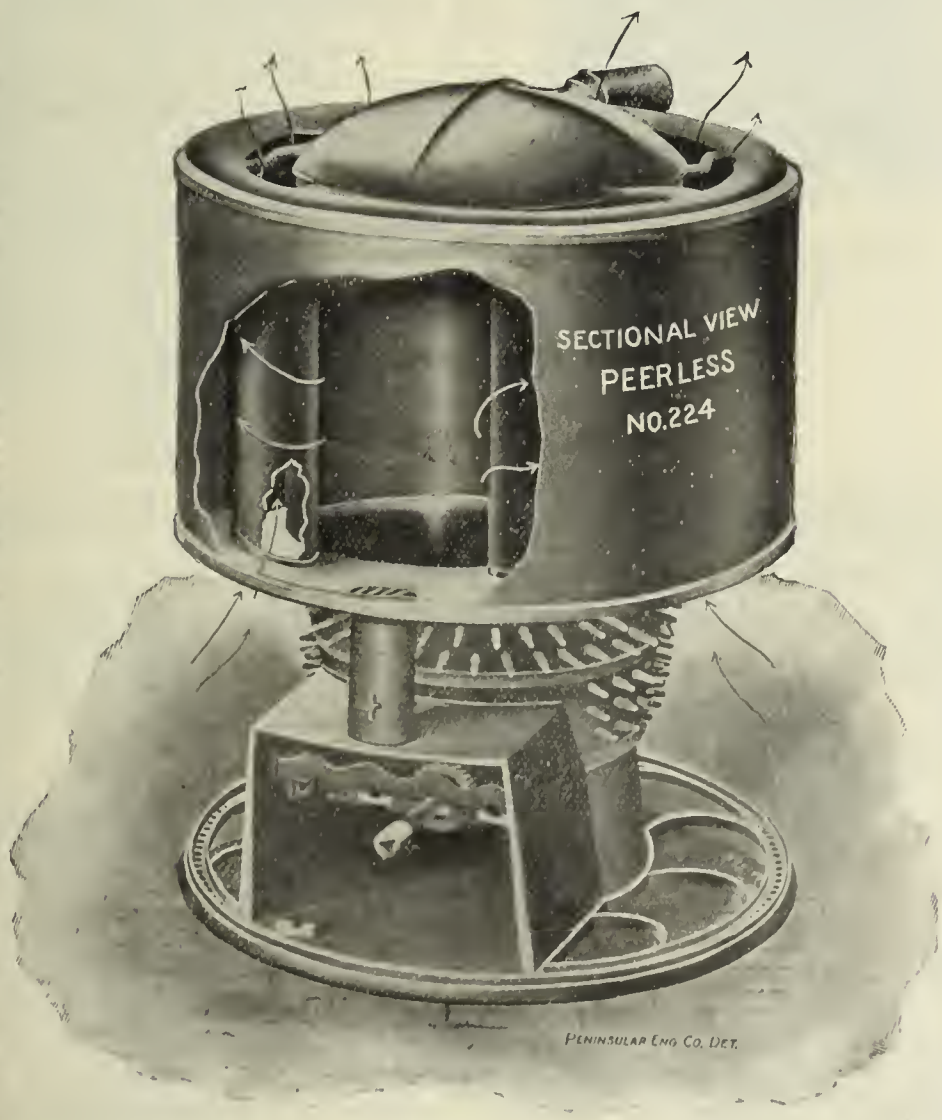

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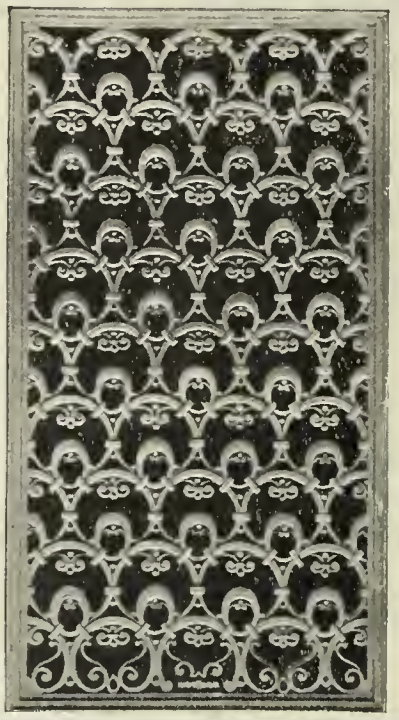

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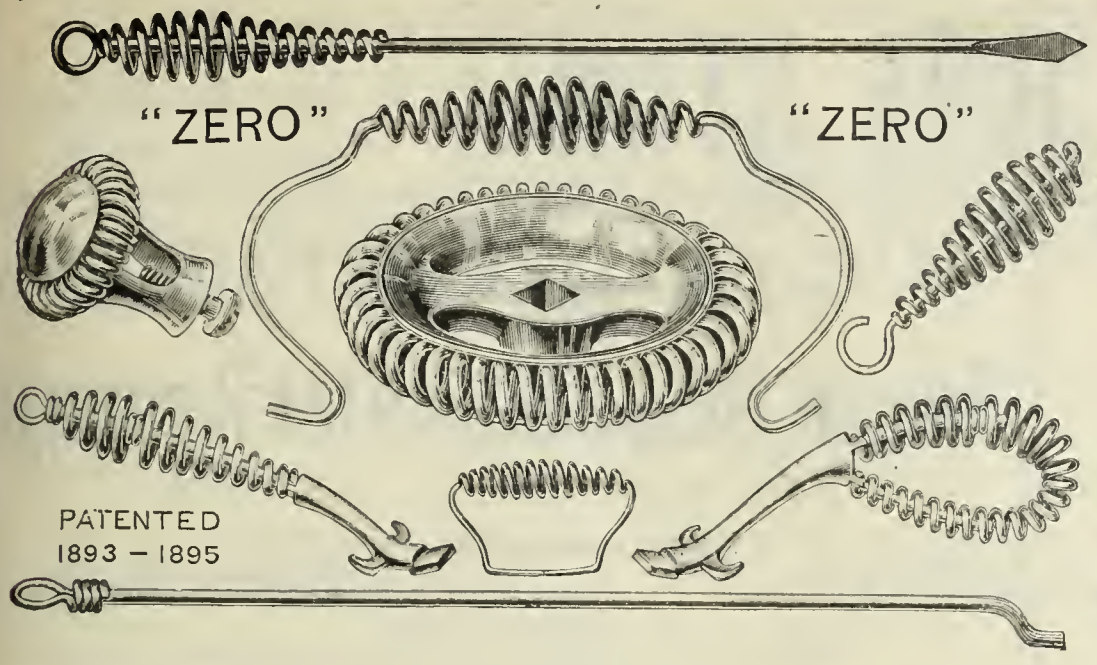

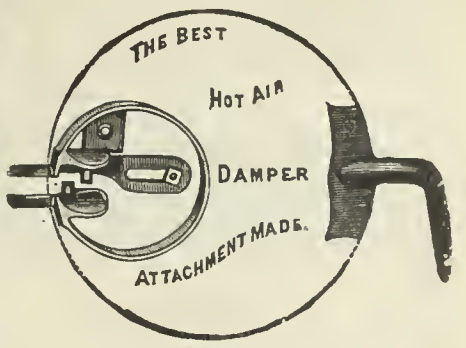

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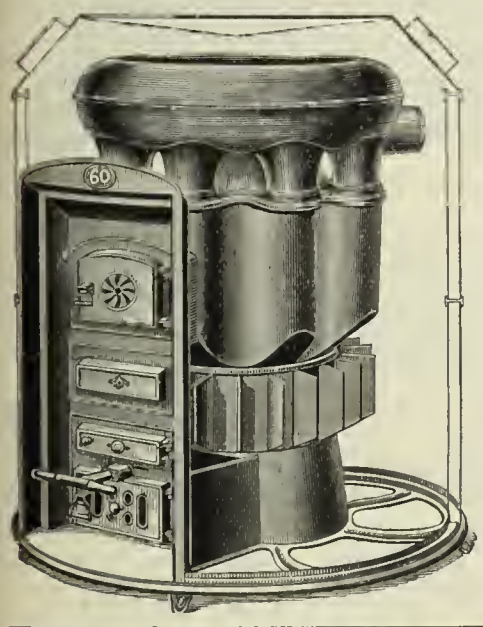

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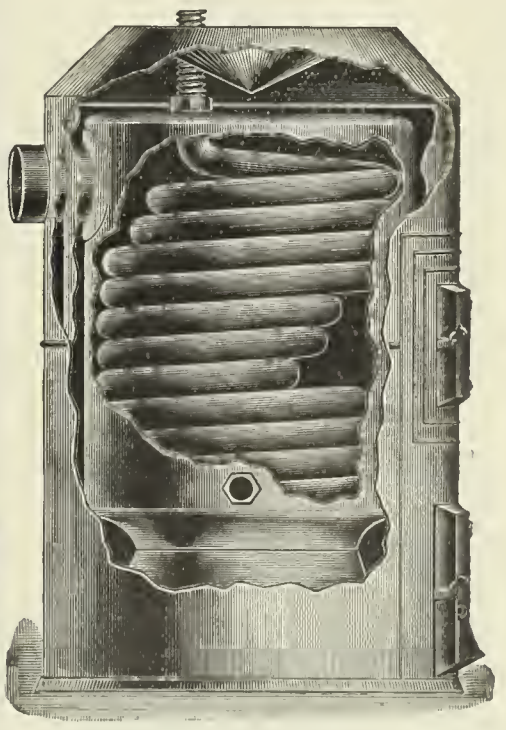

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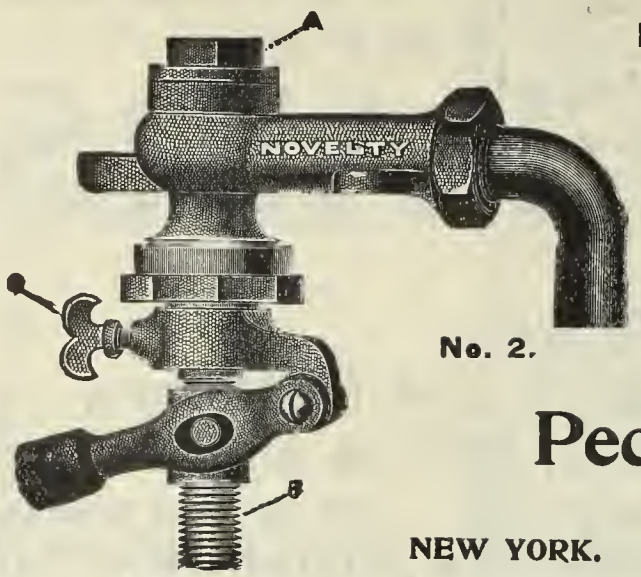

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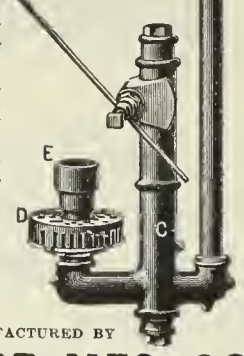

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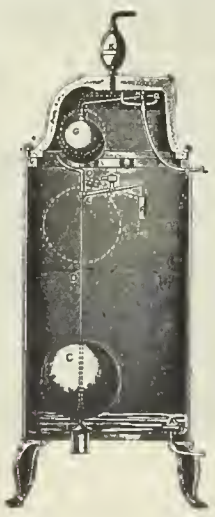

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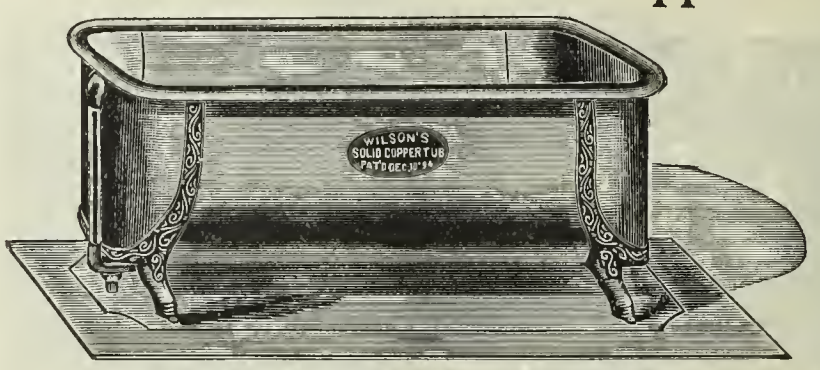

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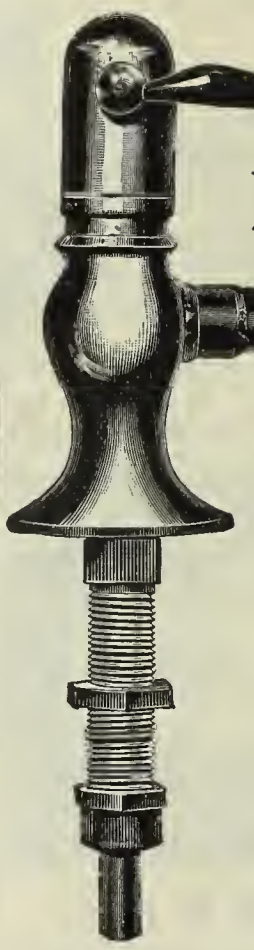

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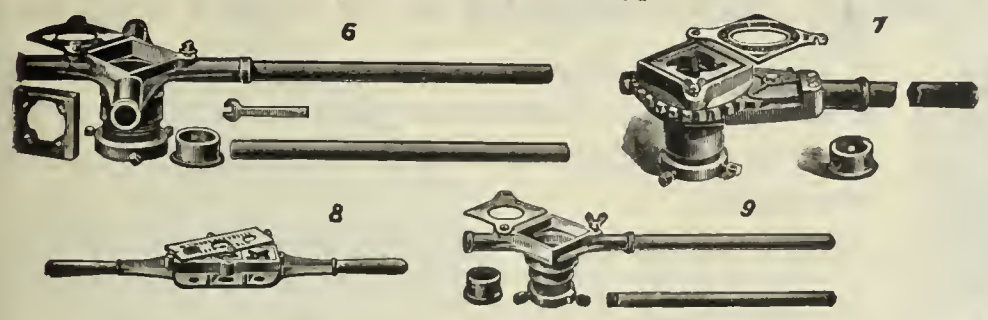

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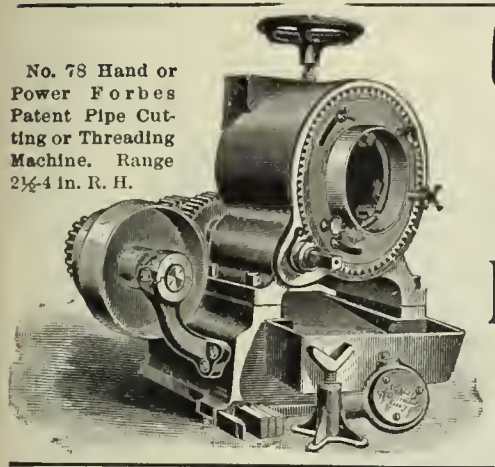

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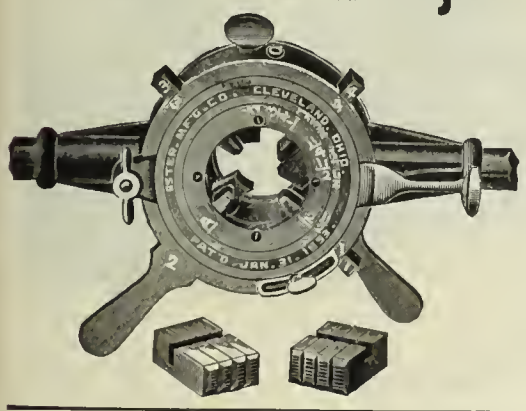

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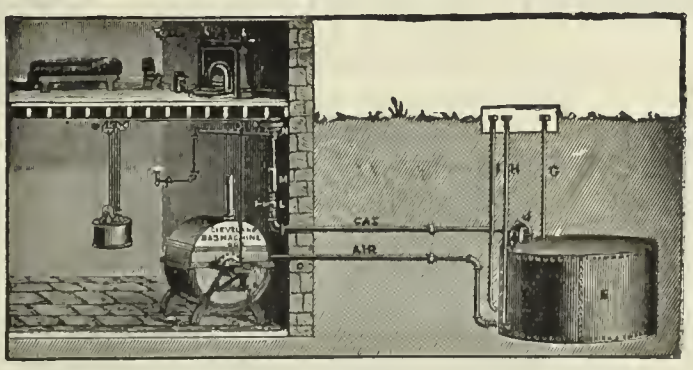

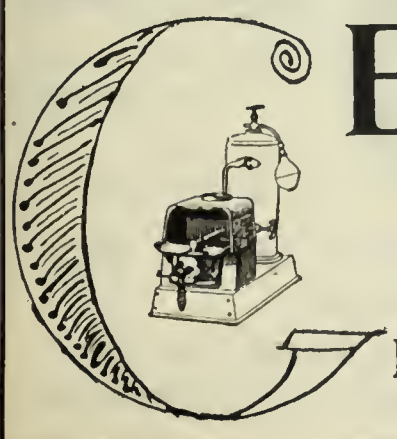

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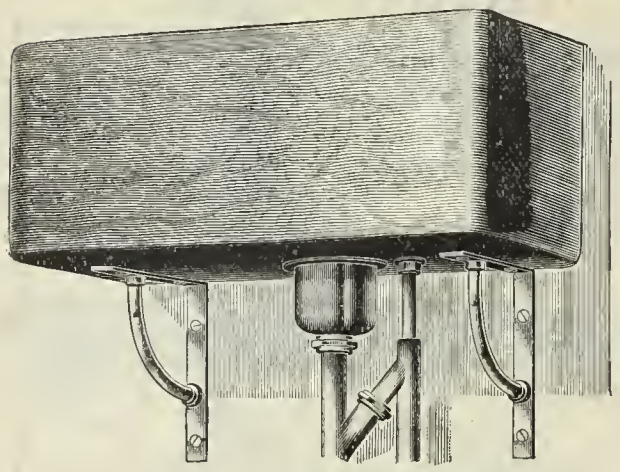
—"Is Miss Straitlace circumspect?" asked Miss Pert.

"Circumspect!" cried Miss Caustic; "why, she won't accompany a young man on the piano without a chaperon."—*Tit-Bits.*

The Sanitas Closet Range.



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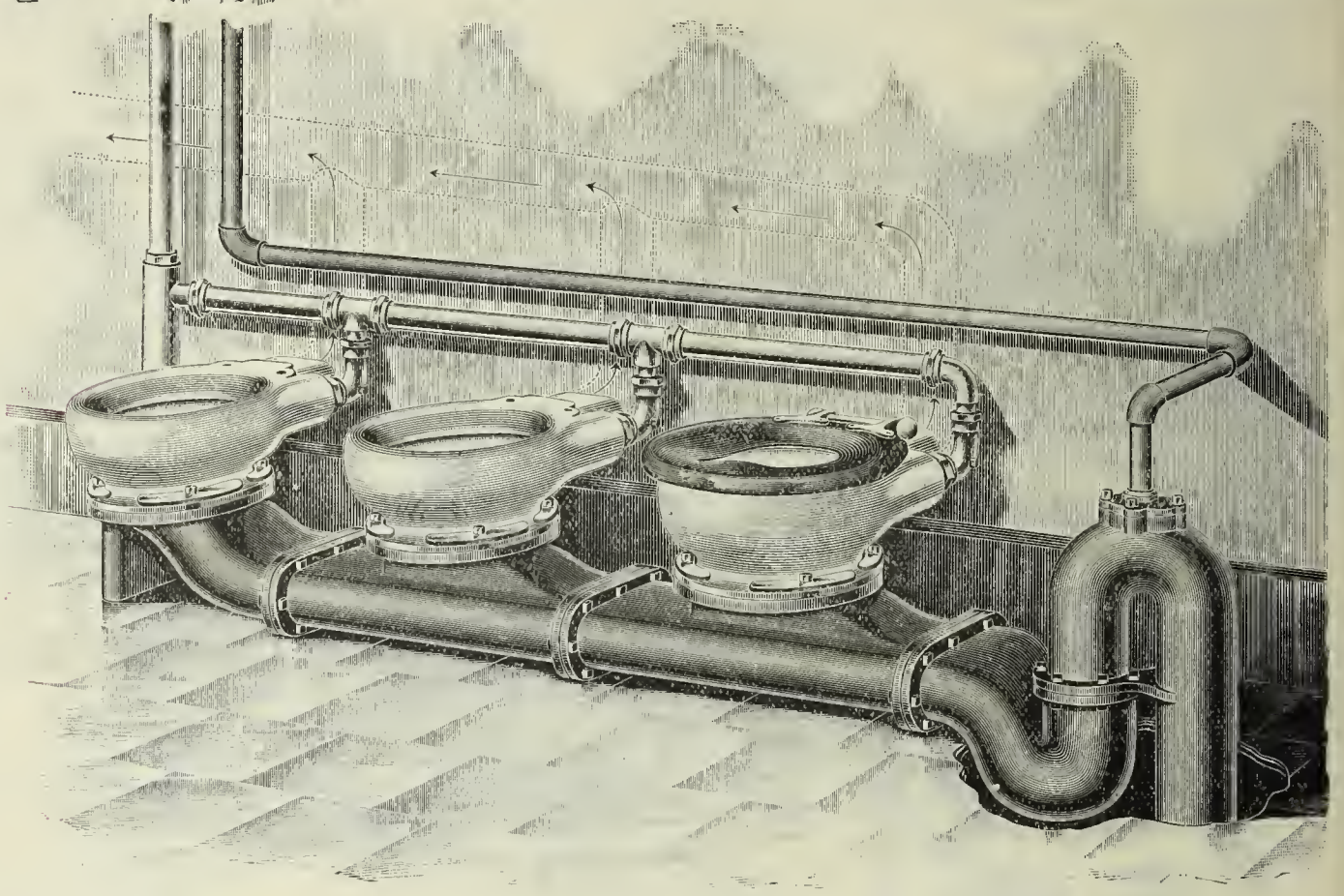
ANY NUMBER OF SEATS FURNISHED FROM 3 TO 10.

In this fixture there are no dry or unwashed surfaces, the flush being through the rim of each bowl and at the end of the range, thoroughly washing every part of the apparatus at each discharge of the tank. Another and important feature is the large local or seat vent, and this, with the large area and depth of water in each bowl, which submerges and deodorizes the soil, makes it a perfect ventilator for the toilet room, and free from all odors. The tank is made of wood very strongly put together, and lined with heavy tinned copper The automatic discharge is very simple and will not get out of order. It works noiselessly at any interval desired, and under all conditions of water supply.



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Send us your address, and in return we will send you a catalogue of the best line of specialties in the United States.

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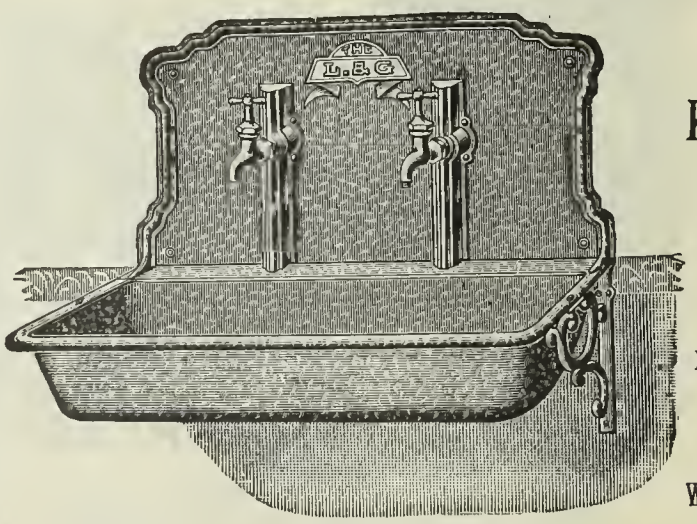

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An article which is in demand at this season of the year.

Practical, Durable, and Serviceable.

No. 08,
10 x 15 x 6½ in.

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Made of smooth finished, cold rolled steel, with a fastening device in the handles (not shown in above cut; which draws together and securely fastens the two Pans, making a Roaster which is beyond criticism. ***The best low priced Roaster in Market.***

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The Only Perfect Self-Basting Baking and Roasting Pans.

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Nothing in the world so convenient for handling stoves.

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We handle everything wanted at Chicago office, 4 S. Canal Street.

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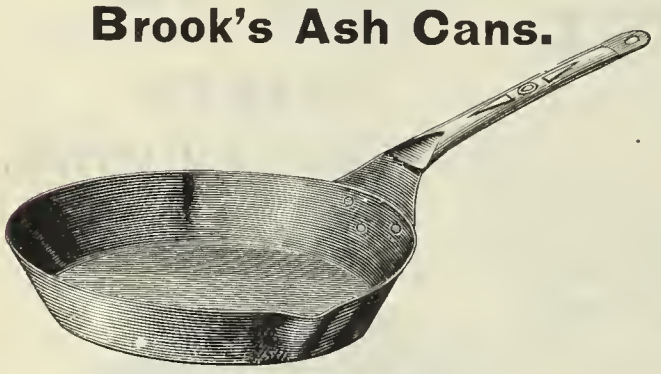

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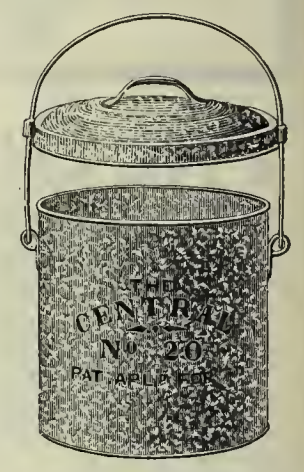
New Price List,
Send for Copy.

Proposals Invited.

LARGEST ASSORTMENT.
STANDARD GOODS.

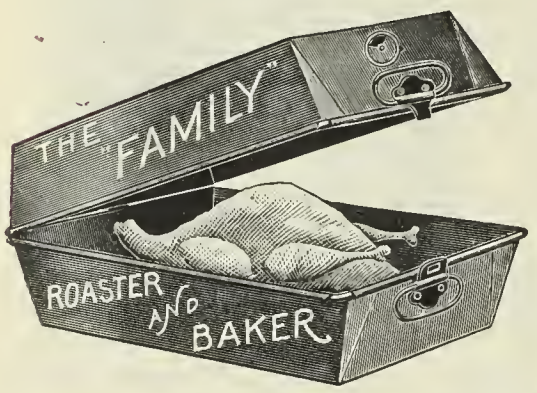


New Ash and Garbage Can.
Cover Always Attached.

We Wish to Introduce to You Our New

"Family" Roaster and Baker . . .

Made from Black Smooth Steel.



Nos.	10	20	30
Inches	8½ x 12½	10½ x 15½	12½ x 17½

The "Family" Roaster and Baker is a well made double roasting pan, the upper part of which is ventilated.

The two parts are joined by a hook hinge, and when closed are held securely together by this hinge in the back and a tongue in front, which slips through a slotted clip that is riveted to the lower part.

Include a sample lot in your next shipment.

THE SIMPLEST AND BEST ROASTER MADE.

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Sold by all Jobbers.

—BLESSINGS OF THE BICYCLE.—"I'm mighty glad my wife coaxed me into getting her a wheel," said the lean passenger.

"Makes her happy, eh?" said the fat passenger.

"She is so stuck on riding that she ain't going to clean house this year."—*Indianapolis Journal.*

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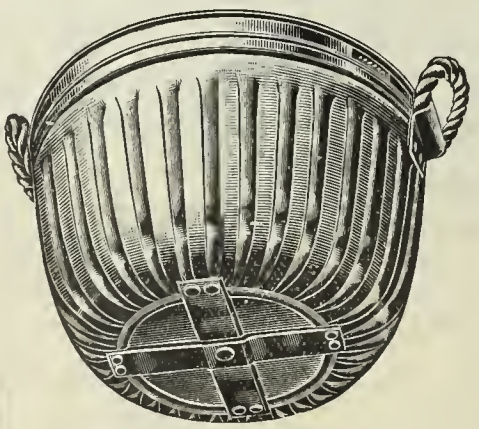

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Corrugated in such manner as to STIFFEN and STRENGTHEN it in Every Direction.

Making it the STRONGEST and MOST DURABLE Basket Known.

Made in any Shape, Size or Style to suit your wants.

Will send sample (1 bushel size) prepaid on receipt of $1.00. Write for our prices.

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TEA KETTLES, RANGE KETTLES, TEA AND COFFEE POTS, WASH BOILERS, STOVE TANKS, &C.,

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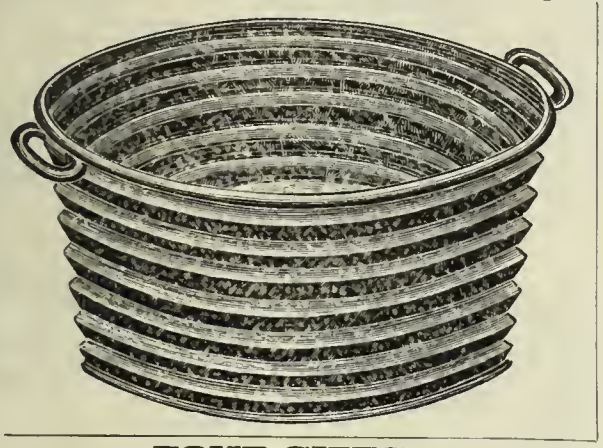
ROME MEANS PERFECTION.



FOUR SIZES.

Number	0	1	2	3
Diameter at top, inches,	20⅝	21¼	23⅛	24⅞
Diameter at bottom, inches,	16⅛	18	19⅝	21
Capacity, quarts,	44	52	62	71

WRITE FOR PRICES.

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Galvanized AND Corrugated WASH TUBS.

(PATENT APPLIED FOR.)

Strongest, Best AND Most Handsome Wash Tub Made.

NO BUCKLING OR BENDING.

CORRUGATED ON BOTH SIDES AND BOTTOM.
SIDES MAY BE USED AS A WASH BOARD.

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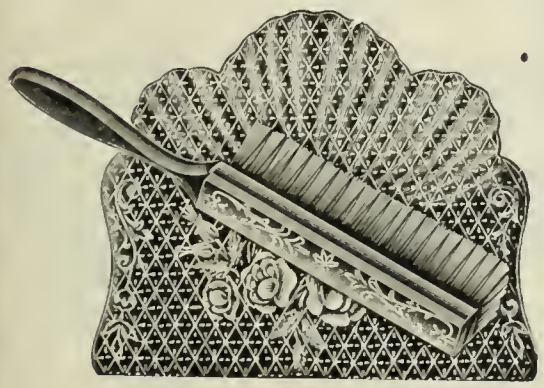

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CONTENTS:

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea Kettles; Oval Tea Kettles; Beer Mullers; Funnels; Coffee Pots; Saucepans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates: Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

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Locks both ways—from pushing in—from pulling out. You can order them from any of the following well-known jobbers:

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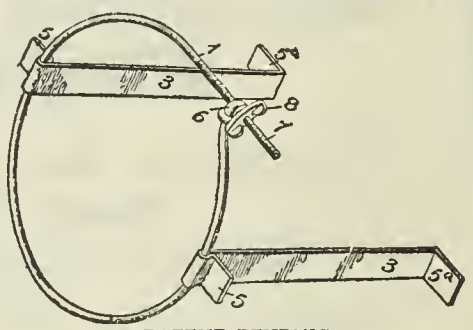

PATENT PENDING.

DIRECTIONS FOR USING.

Place the arms 3 in flue hole, leaving lugs 5 and ring 1 close to outside surface of chimney, insert stovepipe as usual. As stovepipe enters flue hole, lug 5*a* catches on inner surface of chimney. Turn thumbnut 8 until ring 1 is tight around pipe. Push collar to accustomed place aud the entire lock is out of sight.

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Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces.
Length, 10 inches.
Can be sold in all seasons.

Write to Manufacturers for Prices.

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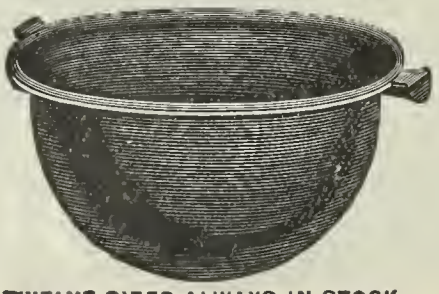

TWELVE SIZES ALWAYS IN STOCK.

Full measure, guaranteed perfect, original patterns, with metal distributed where it is needed. Many Caldrons are made from our castings as patterns. They are inferior to original, as they have light bottoms and heavy sides and hold less.

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We will send one or more of these Stove Trucks on trial for a month and take them back if not satisfactory.

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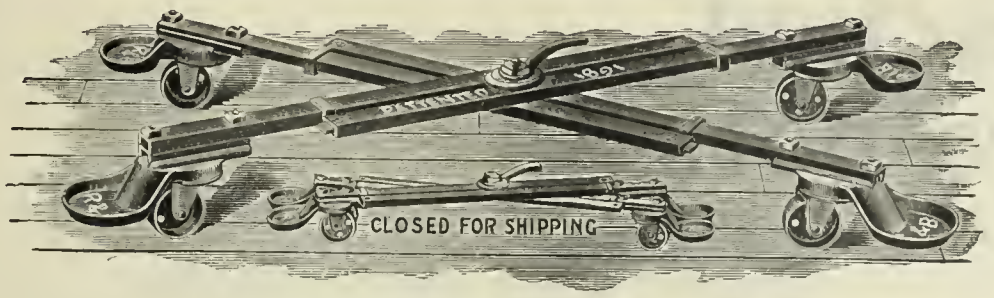

OR RANGE OR RAISE THEM HIGH FROM THE FLOOR.

PRICE, $16 Per Dozen.

It is literally out of sight, and consequently does not detract from the appearance of the stove or range upon it or make them look awkward or ungainly, as all other trucks do.

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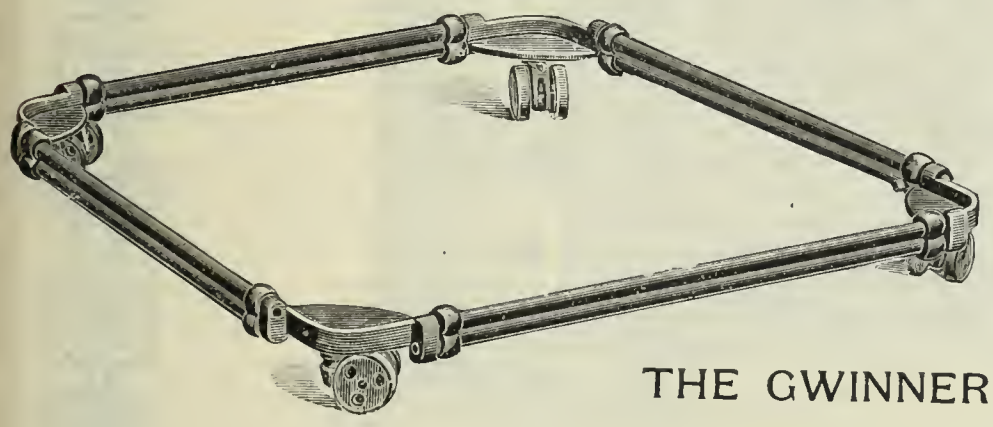

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Stove Truck
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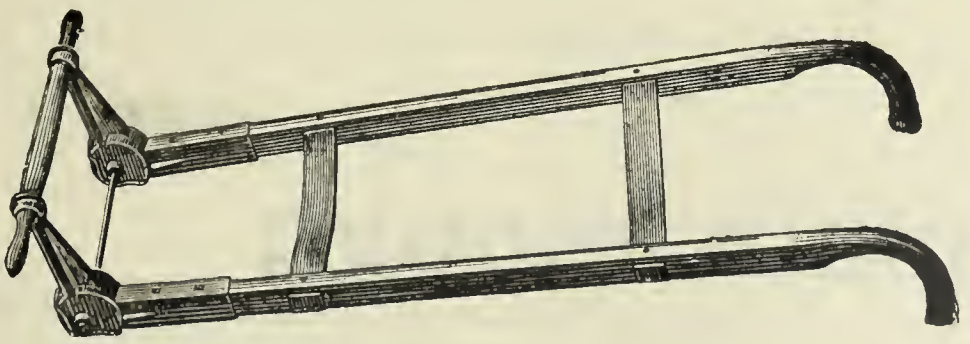

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HANDLED BY ALL LEADING JOBBERS.

KEEP YOUR HANDS CLEAN.

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Is a great improvement over the old stove brush for blacking stoves, **without getting a speck of blacking on hands.**

The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth.

The Dauber is also made of sheepskin, with the wool on, and so shaped as to readily get the blacking into all crevices and corners. It is also adapted to polish russet and patent leather shoes, cleaning windows, furniture, etc.

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PARKS & PARKS, - Troy, N. Y.

—Colonel Joe Johnston, who has been a postoffice inspector for long years, is an old chum of Dockery, of Missouri. The other day, after dinner at Willard's, the two stepped to the cigar stand to get what is indispensable to every true Missourian.

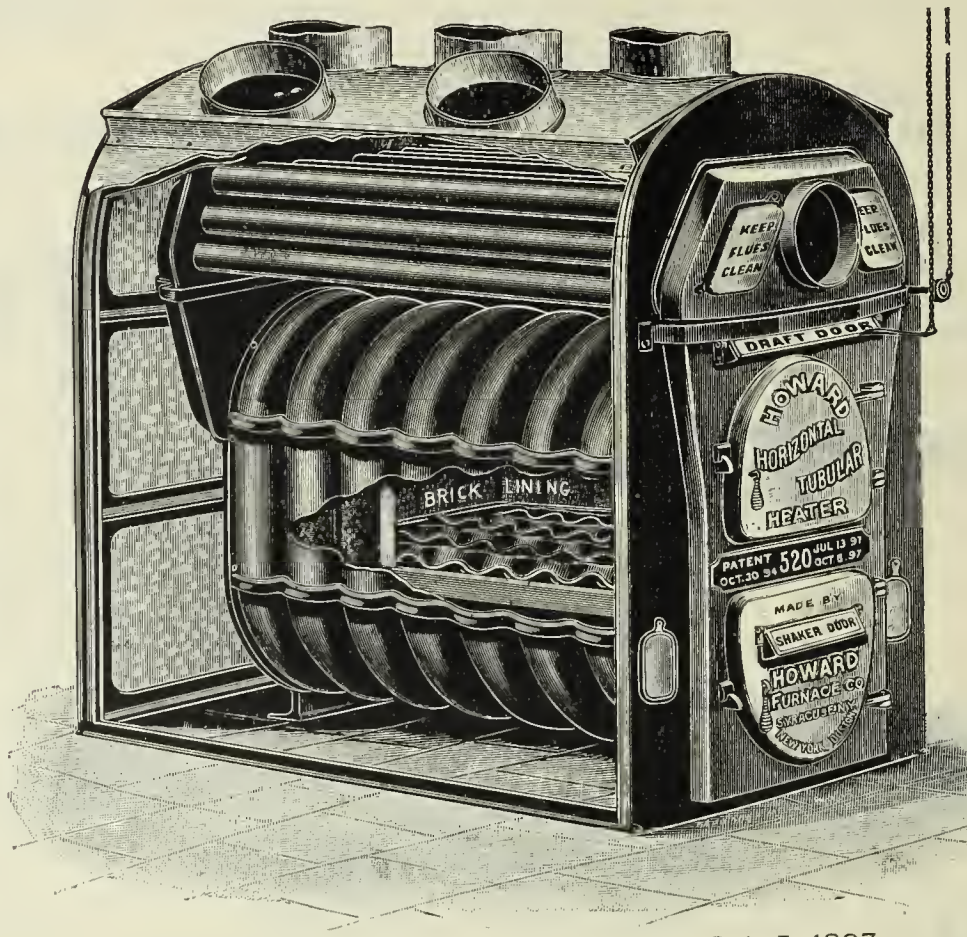
"Let's have some of the kind of cigars Dockery always smokes," said Colonel Johnston. "Here, Dockery, take one, and put two or three in your pocket," added the Colonel, with much exhibition of conscious liberality.

Dockery availed himself of the treat, but without great enthusiasm.

"Now," said the Colonel to the man of cigars, and beaming with comfortable feeling, "give me some good cigars for myself."—*Pittsburg Dispatch.*

cracked fire=pots

hurt the reputation of every furnace. What people want are furnaces of a lasting construction. No dealer who is alive should let this heater escape his notice. That lined fire-pot means something. It means an increase of heat. If you don't believe it "read up" the air tight construction.



Patented: Oct. 30, 1894. July 13, 1897. Oct. 5, 1897.

it is plain enough

to see that the fire-box of this heater is protected. It cannot crack. There are some things about the lining that are original—something that has never been thought of before. For that reason it ought to be of interest to every furnace dealer. Write for circular to-day.

Howard Furnace Co.,

Syracuse, N. Y.

NEW YORK OFFICE,
231 Water St.

BOSTON OFFICE,
198 Spruce St., Station H (Chelsea).

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 23, 1897.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

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The Business Situation.

The general business conditions throughout the country show very little change from last week. Reports to the mercantile agencies indicate a rather smaller distribution at most centers of trade, although the comparison with previous seasons is still largely in favor of the present. The volume of trade, as shown by returns of bank clearings, continues remarkably large, except at the South, in which section the yellow fever scourge imposes an increasing bar to business in all lines. While the bank clearings in New York last week were more than 40 per cent. better than those of the corresponding week of 1896, the figures for New Orleans showed a decline of 20 per cent. For the whole country last week's clearings exceeded $1,300,000,000, being much greater than in any corresponding week of previous years. For the first three weeks of October they establish a record never before reached. For the most part, prices remain steady, but some few declines are noted. Wheat is a shade lower and corn and cotton are down also. The latest reports indicate a very large wheat crop—one of the largest ever gathered—and the current exports of the cereal are among the heaviest on record. Corn shipments, however, have droped off to some extent. The corn crop promises to be large, and, with the stock left over from last season, it will be abundant for home use and for liberal exports. Winter wheat has been helped by heavy rains. In the metal trade, the most sensational event has been a slump in pig lead, which was caused by the unloading of speculative holdings. The market dropped from 4.10 cents in St. Louis to 3.70 cents. The iron and steel market is quieter, but prices continue strong. A pronounced scarcity exists in steel billets and in some classes of finished material. Proof of the great improvement which is taking place in the revenues of the transportation companies is given in the *Financial Chronicle's* compilation of gross railway earnings. In the month of September, 133 roads, operating 100,000 miles, made a gain of $6,386,000 or 14.14 per cent. over September, 1896, the largest increase ever shown in any previous monthly statement. Preliminary reports for the first two weeks of October indicate that this improvement is being fully maintained. A substantial decrease in failures is also reported, the aggregate of liabilities last week being less than for the same week in any previous year. The local money market has eased off on the recent influx of gold from abroad and an expansion in the bank reserves. Stocks have reacted from last week's depression in prices, and a leisurely advance has taken place almost all along the line, stimulated by heavy buying of American securities abroad. There is some complaint about collections in the East; but, as a general rule, they are reported as satisfactory.

An Exposition of American Manufactures.

Plans are being completed for a National Exposition of American Manufactures on a large scale, to be held next year in Philadelphia. The undertaking will be conducted under the joint auspices of the Philadelphia Commercial Museums and the Franklin Institute, aided by a strong committee of leading citizens. Already the preliminaries have been decided upon and plans laid out for the erection of a suitable building in which to hold the exposition. This building will be of a permanent character, so as to be available after the exposition for one of the departments of the Philadelphia Museums. It is practically decided to put it up on the Museum's property on the west bank of the Schuylkill River, south of the South street bridge. The proposed exposition is designed to include, in addition to all kinds of goods of American manufacture, the raw products of the United States, so as to make it practically an exhibition of all articles of export. This would embrace grain, minerals, woods, &c. Such an exhibit would be well calculated to attract a large number of foreign merchants to the Quaker City. The exposition, moreover, will be a valuable object lesson for the two or three hundred delegates from Chambers of Commerce all over the world, who, in October, 1898, are expected to attend a fifteen days' trade congress arranged for by the Advisory Board of the Philadelphia Museums.

The supply of boiling water from street gas lamps is an adaptation of the coin-in-the-slot system recently introduced in England, which, according to the *Colliery Guardian* of London, promises to prove a very popular and beneficial institution. The machine takes the form of a handsome street lamp, with a large base which contains a cistern holding 40 gallons of water. Cold water is fed into a spiral coil and preheating chamber above the light, and there converted into steam by the heat. The steam is then expelled by its own expansive force down the base, where it heats the water in the cistern by circulation through an iron coil, so that the steam does not actually come into contact with the water to be supplied to the public. The directors of the company formed to exploit the system claim that not only could they utilize the waste heat of the lamps in London, but that at 1 cent a gallon they could pay for the gas and for the water used and then leave a large margin for profit.

The annual report of the Director of the United States Mint, covering the operations of the Mints and Assay Offices for the fiscal year ending June 30, 1897, shows the coinage executed during the year as $1,646,705 in gold coins, $21,203,701 silver dollars, $3,124,085 in subsidiary silver and $984,509 in minor coins. Mint Director Preston in his report gives the value of the world's product of gold and silver for the calendar year 1896 as $204,396,600 and of silver in coining value as $215,242,700. The coinage of gold and silver in the various countries of the world in 1896 he places at $195,899,517 of gold and $153,395,740 of silver. Mr. Preston attributes the decline in the value of silver since 1873 to the great increase in production.

THE LETTER BOX.

Galvanized Iron and Galvanized Steel.

From Furnaceman, New York.—I note the inquiry of your Brooklyn correspondent in *The Metal Worker* of September 4, and also the poetic (?) contribution on the same subject. I have been for a number of years endeavoring to purchase an iron that would stand, as I have found in my furnace work that the steel of to-day has nothing like the lasting qualities of the iron of a quarter of a century ago. In a number of instances I have made my specification and furnished the sample and ordered sheets in large quantities, with the hope of getting sheet iron, but invariably have been unsuccessful. I have found in experimenting that the accumulation on furnace drums and in the smoke pipe, when saturated with moisture, generates a weak sulphuric acid which attacks the material and starts a rust which eats out the steel very quickly. Having learned this I have made it a point to test the various samples of steel (which I bought for iron) in order to know whether they would stand in use. I have used a solution of 25 parts of sulphuric acid and 75 parts water, and suspended the samples of supposed iron in it, having previously weighed them very carefully and accurately on a chemist's scales to get the weight in grains. The best bloom iron which was known to the tinner of former years will stand this test with so little loss as to be hardly noticeable. The greatest loss that I have found in material of this kind was a fraction over 1 per cent., while with steel I have records of a loss of 90¾ per cent. I have brought this to the attention of the manufacturers, and the best success that they have been able to reach in producing a substitute for iron has shown a loss of but 19 per cent. under my test, and this has varied up to 35 per cent. loss.

Wants to Make a Peppermint Test.

From W. F. S., Escanaba, Mich —I would be pleased to have the following question answered in The Letter Box. I have a contract for a job of plumbing that specifies an oil of peppermint test and I would like to know how to apply it.

Answer.—This question has been treated a number of time in *The Metal Worker*, and we reprint the following from a previous issue: Owing to the strong pungent odor of the oil of peppermint, in a test of this kind it is safest to have two persons take part in the work. One should ascend to the top of the building, on the outside, where the vent pipe comes through the roof, provided with a bucketful of hot water and a bottle containing from 2 to 4 ounces of oil of peppermint, according to the size of the building. All the windows of the house and openings into it should be closed. The more experienced plumber should then be on the inside of the building, and at a prearranged time the workman on the outside of the building should pour a small quantity of the hot water into the vent pipe, then pour in at least 2 ounces of the peppermint, after which he should pour in the remaining quantity of hot water and cover the opening with a cloth of some kind to prevent the escape of the pungent odor. By means of the hot water the oil of peppermint will be carried down to the horizontal drainage pipe, and in a short time the entire system will be filled with a peppermint odor. If any of the trap seals are broken or the plumbing work is defective, either in the calking of the soil pipe joints or the wiping of the joints connecting the traps with the soil pipe, the odor will find an entrance, which will be detected by the plumber on the inside of the building, who should visit each of the various fixtures and lines of drain pipes in the building for the purpose of learning if there be any leaks. The greater the care he uses in his search the less will be the likelihood of any leaks in the drainage system escaping his notice. If the vent pipes have not been properly arranged, so that it is possible that the traps in some of the fixtures have been siphoned, this will be quickly learned from the strong odor that will enter the building. If the work has been properly planned and properly executed, however, the test will bring to light no defects.

Sheet Metal Supplies for the Klondike.

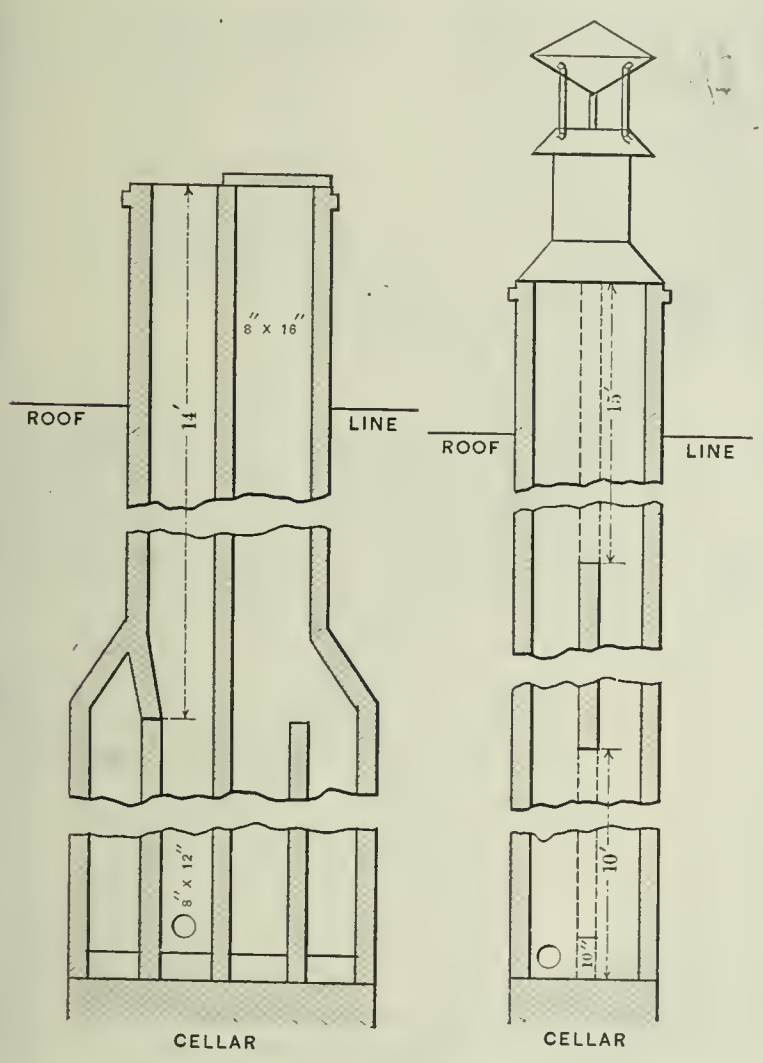
From C. N., Philadelphia, Pa.—I would like to find out what the prospects are for work and trade in the tin, sheet iron and stove line at Seattle, Wash., or Dawson City. I am thinking of going to one of those places to engage in that line of business in view of the coming spring rush to the Klondike. It seems to me there will be a big demand for sheet iron stoves and other metal work used in the mining districts, but there are a good many things to be found out before taking this step concerning freight rates, nearest point for purchasing supplies, kind of work to be expected, prices, &c. I do not suppose any very accurate kind of answer can be given to these questions, but any information you could furnish would be very much appreciated, and I believe a number of other readers would be interested in what you would say on the subject.

Answer.—The excitement over the wonderful gold discoveries in the Klondike region has given rise to all sorts of exaggerated reports, and it is not easy to get a plain, business statement of affairs in that part of the country. We have, however, endeavored to secure some reliable information for the benefit of our correspondent, and we have been favored with a letter from a Seattle correspondent, who is perhaps as well posted as any one concerning the chances for trade in that region. From this letter we extract the following information: The present freight rates from Seattle to New York, Chicago and Buffalo on sheet iron and tin are 70 cents per hundredweight, this being a drop of 4 cents from the rates of two months ago, the previous rates having been as high as $1 per hundredweight. The last drop was made to meet competition with water rate by way of Cape Horn on home and foreign shipments. The Seattle jobbing market has consumed 25 carloads of sheet iron and three carloads of tin in the past year. This does not include roofing material or the very large amount used by the salmon canneries, which buy direct in Europe and the East. The Yukon outfitting trade has kept ten to fifteen firms busy as they could be during July, August and September, and the prospects are that any one going to Seattle with sufficient capital to enter into competition with local firms will have a fair show of success. Seattle is believed to be unquestionably the best and nearest city from which to start in business to reach the Klondike trade. It is the last port of departure for Alaska from the United States, and every vessel which has gone north this season has either left Seattle direct or touched there as the last port. Sixty-five vessels left for the north during the past season in 68 days. Furthermore, Seattle is the only point on the Pacific Coast which is directly reached by three of the competing transcontinental railroads. Our correspondent who furnishes this information does not think it advisable to start in business at Dawson City, as that is only a mining camp, while the supply point for Dawson City and the rest of Alaska Territory is Seattle. If "C. N." would like further information we would suggest that he send for the Klondike edition of the Seattle *Post-Intelligencer*

for Wednesday, October 13. This is an eight-page paper, giving very complete and thorough information about the Klondike outfitting trade for that region and a great deal of miscellaneous information relating to it. The *Post-Intelligencer* will be sent to any address, we understand, for 75 cents per month, or $4 for six months, and will probably keep our correspondent, "C. N.," advised of all important matters relating to trade in that country.

Solving Chimney Problems.

From C. F. H., Brooklyn, N. Y.—Having seen a number of inquiries for assistance in overcoming chimney difficulties, I relate the following for the benefit of those who may be interested. It is well known in the manufacturing houses where heating apparatus is a specialty that the chimney is never at fault, but it is always the furnace, steam heater or the hot water boiler that will not draw, so complaints come in from customers. In one instance I was sent to a place to apply a remedy where a boiler having ample capacity to carry the radiation connected with it utterly refused to heat the building because it would not draw. On arriving I found a chimney of the character shown in Fig. 1. This chimney was so located in the building that it was only used for the heating apparatus, and, as will be seen, there were four 8 x 12 flues running up from the cellar through the building. These flues merged into two 8 x 16 flues near the top, a partition 4 inches thick being run up from the cellar. Fourteen feet below the top of the chimney the side flues in each case were drawn over and an opening was left at the top of the 4-inch partition which divided them from the central flue.



Solving Chimney Problems.—Fig. 1.—Leaky Partitions Make Four Flues Into One.

Fig. 2.—Utilizing Two Flues as One.

The heating apparatus was attached to the flue as shown by the round opening for the smoke pipe at the bottom. There was a square opening at the base of each of the other flues, so that they might be cleaned in case of necessity. On arriving the heater had a fire in it which was in a dull condition, only needing a strong draft to make a bright fire. I had the smoke pipe detached, and on looking up the chimney to which it was connected could see daylight, and this was the reason why it had been selected for use with the heater. The operation, however, clearly showed that something was wrong, and I went up on the roof and had a candle placed in the bottom of the flue that had been used and the outside flue next to it at the bottom. This showed a down current which blew out the candle. The candle, however, was lit long enough for me to see that there was an opening from the side flue into the central flue, and also I could readily see that there were but two flues at the top. I was firmly convinced that a portion of the air traveling up the chimney went down at the side flue; consequently I measured the distance from the top of the chimney to the partition I then had a hole cut in the side of the chimney and the side flue stopped off. I then went into the cellar and had the openings in the bottom of the side flue cemented tight. On connecting the smoke pipe the heater did better, but the chimney failed to work as it should. I concluded that the partition between the flues was no longer in an air tight condition, for from previous experience I had learned that the mortar would be eaten out by the gases and a partition of that character prove of very little assistance in separating two flues I then had the openings at the bottom of the two flues which were not in use cemented tight, which gave me another improvement, but not sufficient. My next step was to put a flat stone on top of the chimney that was not in use and cement it tight. I now had the flue which was in use so fixed that no air could get into it except through the smoke pipe at the bottom, and all who were interested in the case were delighted to see the fire burn up as it should and the heating system work in a manner which was entirely satisfactory from every standpoint.

On another occasion I was called to see a "sick" job, where the heater would not draw, nor would it carry the radiation connected with it. I immediately commenced to investigate the chimney, and although it was of the peculiar shape of 9 x 10 inches, it was not large enough for the boiler connected with it. In this case there were two flues, side by side, as shown in Fig. 2, and when I saw the chimney did not have sufficient capacity it was suggested that an opening be cut in the partition between the two flues at the bottom. In disconnecting the pipe preparatory to this work I found that the pipe was shoved into the chimney so far that it entirely cut off the draft. When the pipe was changed the chimney still did not work as it should, and I proposed that instead of running the pipe into the chimney from the side, a round elbow be used connected with the chimney at the bottom. The proposition to cut a hole between the two flues so that both could be used for the heater did not meet my views, as I told them it would produce a circulation and impede the draft rather than aid it. However, this was done with the effect I had predicted. The opening in the bottom of the second flue was made and an iron bar was used to break away the partition between the two flues as far up the chimney as could be reached, which was about 10 feet. I then went on top of the roof and was successful in having the partition between the two flues removed for a distance of about 15 feet, so that while the flue was divided for a considerable distance it yet had some of the benefits of a single flue of 10 x 18 inches in size. With the aid of an Emerson cap on top of the chimney the difficulty was removed, and the apparatus went ahead and carried the radiation connected with it and heated the building satisfactorily.

Patterns for an Emerson Ventilator.

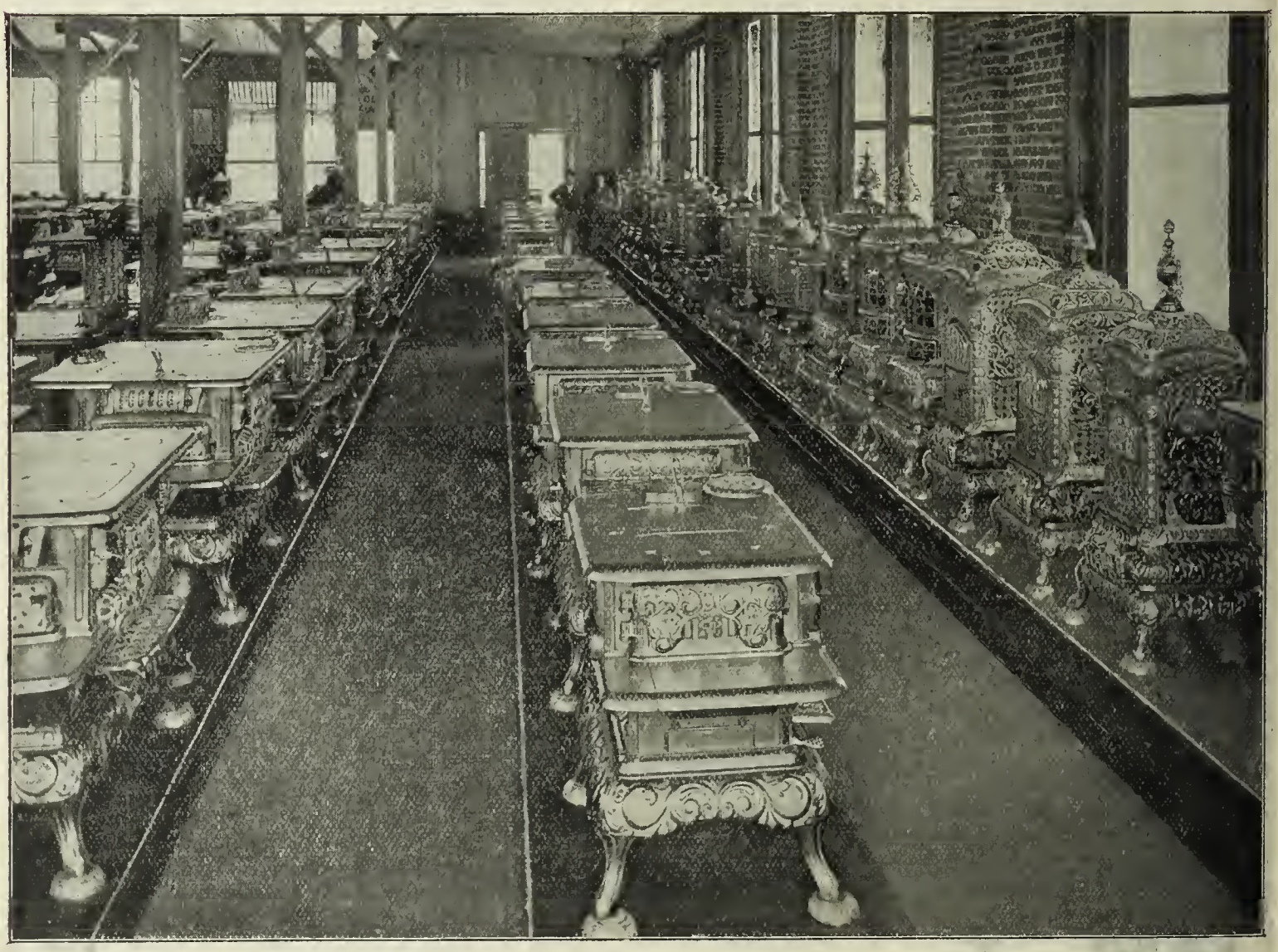
From T. B. D.—I notice an article on patterns for Emerson ventilator by "W. N.," in the issue for October 9; but the form there given is all wrong, as the real Emerson ventilator has no cone above the opening from the flue or chimney, there being simply a flat plate. The only conical piece is that around the edge, as "W. N." showed.

STOVE TRADE NOTES.

Plant of the Charter Oak Stove & Range Co.

We present herewith a number of views representing various departments of the plant of the Charter Oak Stove & Range Company, St. Louis, Mo , who are manufacturers of the well-known line of Charter Oak stoves and ranges. While the company have only been in business something less than two years, they have rapidly forged to the front, and in addition to building up a large and profitable line of trade have improved and modernized their plant to a point where it will favorably compare with other stove manufacturing plants in the country. We have secured a number of photographs of different departments of their works and present a series of engravings which demonstrate more forcibly than words can describe the large and commodious plant which this company have at present in full operation. It occupies two city blocks, or an area of 4½ acres. They manufacture a full and complete line of first-class, medium and low priced cooking stoves, ranges, heating stoves, laundry, tailors' and miners' stoves, and in addition make a full and complete line of steel ranges, which are offered under the names of Charter Oak and Excelsior.

Charter Oak stoves and ranges have been made since 1852, and have been on the market continuously since that time. The company advise us that the demand for this line of stoves and ranges is of sufficient proportions to indicate that they have not as yet lost any of their popularity. The sample room and office building is 80 x 112 feet, and is substantially built of brick with a very attractive galvanized iron front, painted in imitation of stone. The firm name, which appears immediately above the windows, is in raised gilded letters, forming a very striking contract against the stone effect. The center cornice above the entrance carries in metal the well-known trade-mark of the company, the words "Charter Oak Stoves" and the rays radiating from the center of the trade mark being gilded. The interior of the building is finished in hardwood, being well ventilated and lighted by large and airy skylights. The aisles are wide and the platforms carrying their lines of sample stoves are painted a bright red and then treated to several coats of varnish. These platforms are 15 inches in hight. This building contains all the necessary conveniences incident to an office and sample room, being provided with bathroom, stationary washstands, coat closets, room for stationery and office supplies, fire proof vaults, &c. On the sample floor are nearly 300 different stoves from the highest priced base burner, handsome and artistic in its design and finish, to the much reviled but still virtuous "air tight" stove commonly referred to as the "tamale." In Fig. 1 of the engravings is presented a view of the south side of the sample room, showing a portion of the company's line of cooking stoves, ranges and heating stoves, and in the distance the office of the vice president and general manager. At the right and left hand of the main aisle of the room are arranged the Royal Charter Oak and the Grand Charter Oak stoves. At the north side of the sample room is to be found a line of high grade cooking stoves and ranges, medium priced cooking stoves, and at the extreme rear against the wall is arranged a line of Charter Oak and Excelsior steel ranges.



Plant of the Charter Oak Stove & Range Company —Fig 1.— View in Samp'e Room, Showing a Portion of Two of the Side Aisles, with Office of Vice-President in the Distance.

Fig. 2 of the engravings represents the interior of the private office of Vice-President and General Manager Geo. D. Dana. This office is finished with hardwood floor and ceiling, and the side walls carry a number of fine engrav-

ings. An old fashioned fire place gives a feeling of comfort and genial warmth to the room. Here Mr. Dana can be found daily. On the mantel are a number of photographs of Mr. Dana's personal friends, the place of honor being accorded a steel engraving of Giles F. Filley, the veteran stove manufacturer and founder of the Excelsior Mfg. Company, to whom the Charter Oak Stove & Range Company are successors.

Fig. 2.—Interior of Private Office of Vice-President and General Manager G. D Dana.

Fig. 3 of the engravings shows Secretary L. D. Vogel's office, with salesman's desk and stenographer's quarters, while Fig. 4 shows the treasurer's office, bookkeeping and billing department. Outside the warehouse is a railroad switch 690 feet long, with facilities for handling ten cars at a time. The cars are run right up to the doors of the shipping department, and goods are loaded and unloaded in the least possible time. Fig. 5 of the engravings shows the molding floors, and practically speaks for itself. It is one of the largest in the country, and a glance at the engraving will readily convey an idea of its immensity.

This company are now employing over 400 hands, and have a cupola capacity of melting 78 tons of iron daily if necessary, and their total pay roll now amounts to $25,000 per month. A steady increase in their business is noted from month to month. Their business for September showed an increase of over 140 per cent. in comparison with the corresponding period of last year. The officers of the company are as follows: President, Wm. Duncan; vice-president and general manager, Geo. D. Dana; secretary, L. D. Vogel; treasurer, Theo. H. Hammond.

A recent issue of the Richmond *Times* contains a very interesting description of the works of the Richmond Stove Works, Richmond, Va. It refers to the progressive character of the management, and to the fact that there is probably no one industry in the city "which more thoroughly represents the ingenuity and practical business tact of the Virginian." W. J. Anderson, the president, and R. G. Reynolds, the secretary and treasurer, to whose well directed efforts the success of the company is largely due, are among the leading exponents of the "patronize home industry" idea, and they evidently practice what they preach, in the hope that it may help the city and indirectly, of course, themselves. The company have a large and growing business covering a wide territory, although their greatest efforts are put forth in connection with the large local trade.

Fig 4.—Office of Treasurer Theo H. Hammond, and Bookkeeping and Billing Departments.

A little circular of pale blue paper is received from Gurley Lester, Capac, Mich. The circular makes a forcible presentation of the advantages of the Favorite Stoves

and Ranges, the trade-mark of these goods occupying the center. Those who receive the circular cannot but be impressed with the fact that the Stoves which it exploits are well worthy of an investigation by prospective purchasers.

Report of Montana State Commission on Heating.

The sections of the report of a special commission to the Governor and Board of Education of Montana treating of steam, hot water and hot air heating have appeared in previous issues of *The Metal Worker*, and the following is the conclusion arrived at as a result of their investigations:

Taking the measure of good ventilation as a standard, we weed out all methods which do not provide for it, and this leaves for our consideration two general methods of heating—viz., steam heating and warm air heating, and but two subdivisions in each class, viz.:

A. Steam heating by indirect radiation and gravity ventilation.

Fig. 3.—View in Office of Secretary L. D. Vogel.

B. Steam heating by indirect radiation and hot blast ventilation.

C. Warm air heating by the gravity system of ventilation.

D. Warm air heating by hot blast system of ventilation.

In comparing indirect heating and ventilation above mentioned, and granting that good construction in either will give equally as good results, we come to consider the other items of safety, first cost, and cost of management and maintenance.

Safety: It will be immediately granted that a warm air or furnace system is, when properly installed, a safe system. It will not set the building on fire, and it cannot blow up or freeze up. It will also be granted that there is no danger from fire with a steam system properly installed.

We are considering the matter as it relates to the installation of a heating plant in our public buildings in Montana. We have never given this matter of the safety of a steam boiler much thought, because, fortunately, we have never had a boiler explosion in any of our public buildings.

This may be attributed to the fact that all of our buildings fitted with steam heating apparatus are comparatively new. But it is a startling question, and we now feel satisfied that danger exists and an explosion may happen at any time, and we would recommend that all steam boilers in use in our public buildings be subjected to a rigid inspection, and if found in a dangerous condition, that they be immediately made as safe as possible, or removed and a safe apparatus put in. We also think that our Legislature should be asked to pass a rigid boiler inspection law, making the same applicable to heating plants. To give you some idea of the danger in the use of steam boilers, we refer you to the following reports from State Inspectors and also to the daily press, for since attention has been called to it we note that hardly a day passes that some such accident does not occur in some portion of the country.

The State of Massachusetts is divided into districts, and each district is in charge of a district inspector. These inspectors make an annual report to Rufus W. Wade, Chief of Massachusetts District Police and Chief Inspector of Factories and Public Buildings. Chief Wade makes a detailed report of all the district reports to the Governor of the State, and we quote from his reports relating to the dangerous condition of boilers and the incompetency of men in charge of them. The summary of this report for 1893 is as follows :

Out of a total of 171 boilers inspected, 481 defects were found, and 114 were pronounced dangerous. In conclusion, Chief Wade says : "I cannot too earnestly recommend the enactment of a law providing for the inspection of all steam boilers and the licensing of all persons in charge thereof. . . . The safety of the public requires this safeguard." In the report of 1894 we found 14 pages devoted to defective boilers and incompetent persons in charge, and he ends with the following summary and recommendation : "Number of boilers inspected, 405 ; number of defects, 842 ; dangerous, 169. My previous reports have called attention to the fact that defects in boilers are very common in school houses, and they are decidedly more dangerous because the steam is liable to be shut off entirely by the teachers, and the janitor is away, with no one to take care of the hot fire. There are other boilers in use equally as dangerous, and as they are never inspected, no one knows anything about them. The janitor gives them scant attention, and every one about them is living in fancied security that being low pressure boilers they can never do any harm. Quite a number of these low pressure boilers have exploded lately and with disastrous results. They are safe if properly designed, so long as the pressure is low, but the inability to keep the pressure low is a defect very common in many of them. Every safeguard should be provided and made

compulsory to guard against increase in pressure, as well as against deterioration in the boiler."

First Cost: This is a determination hard to arrive at, because no two buildings are alike, and, therefore, the first cost will differ. The information we can obtain, however, leads us to believe that the first cost of a steam system will be much greater than the first cost of a warm air system.

Cost of Management and Maintenance: The cost of maintenance is the cost of labor and the cost of fuel. On the first item we have shown that, in the management of a steam plant with safety, a licensed engineer is necessary, and his presence should be continuous about the plant. This kind of labor is high priced and involves an extra expense for janitor services.

In the management of a warm air plant, on the other hand, we found the janitor able to do both. In the matter of cost for repairs we have no reliable data and can only judge from our own observation. This would lead us to conclude that the necessary repairs for a steam heating plant would greatly exceed the wear and tear on a less complicated furnace system.

In the matter of fuel consumption we have more definite information. State reports and individual experiences furnish data upon which estimates may be made and conclusions drawn. From our researches and personal inquiry of parties in charge of different systems of heating plants we are led to believe that the cost of fuel under the furnace system, when the same is properly installed, is fully one third less.

We have often been puzzled in reading the reports of the expense of heating and ventilating buildings to notice the vast difference in cost, not only in different localities and systems, but in the same system and in the same locality. Our investigation on this point has led us to the conclusion that some of the reasons are: The quality of fuel and difference in faithfulness and efficiency of attendants, or their control by the principals or teachers, or of the teachers themselves. The above are potent causes for success or failure. But another, and not the least reason, is found in the kind and quality of materials used in the construction of the building proper. In this latter respect we have found that the thermometer indicated on a solid brick wall 12 degrees less on the windward side than on the leeward, and these differences are especially noticeable in Montana on account of greater prevalence of wind. This caused us to give attention to hollow walls and walls constructed of hollow brick, or brick with hollow tile linings. The latter we found 9½ degrees warmer than the solid brick walls, and this great difference in temperature, when considered for the whole outside wall of the building, would indicate that it is a point of economy well worth attention. To a large extent, also, should the subject of storm doors and double windows be considered and adopted in this climate.

Natural gravity is preferable, with a system as simple as possible. The carrying of supply or exhaust pipes on a level for any distance we found very detrimental to a satisfactory working, particularly if said pipes are carried through a cold room. In several instances where the exhaust pipes were carried 10 feet and more to a central exhaust shaft, the exhaust was diminished to such an extent that the supply was also seriously interfered with. This will be particularly noticeable if no mechanical force is employed with the supply. We find that it is not a very difficult matter, neither does it require large expense, to change the air in a room six times per hour; or if applied to persons, it should be 30 cubic feet of air per person per minute. Unpleasant drafts must be avoided under all circumstances. This can be done by proper inlet and foul air outlets without any difficulty.

Fig. 5.—Interior View, Showing Molding Floors.

In answer to the question, What is the best form of construction, or rather, which method of warm air heating we should use in the particular buildings we have under consideration, we would advise that it rest largely upon the advice of the engineer of the heating system we adopt. His experience in hundreds of buildings of a like character should render his opinion of more value, and it should be given more weight than that of those of less experience or a more limited information.

The Ringen Stove Company of St. Louis, Mo., have adopted the plan of attaching to each of their Quick Meal Steel Ranges a card giving in detail the special features embodied in the Range. The card is self explanatory, and the heading is as follows: "To the Salesman: This card explains briefly the special features of the Quick Meal Steel Range, and is intended as a reminder so as to help you explain them to your customer."

The Kernan Furnace Company, Beekman and Pearl street, New York City, are the Eastern agents for the Ferrosteel Registers, made by the Ferrosteel Company, Cleveland, Ohio, and announce in our advertising columns that they carry a full line of sizes in stock and are prepared to fill orders promptly.

The Standard Oven Indicator.

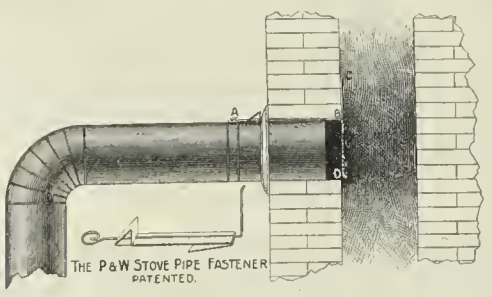
In the accompanying illustration we show the Standard oven indicator, made by the Standard Thermometer & Electric Company of Peabody, Mass. In a circular in reference to it they say an oven thermometer is one of the necessities of the time. By its use fuel is saved, by avoiding overheating and vexation is avoided by having the oven at the right temperature for any kind of baking, when the food is put in the oven, and the indicator gives evidence of a rise or fall in temperature while the baking is going on, so that if an even heat is required the drafts of the stove may be adjusted to maintain it. On the Standard indicator there is a dial from which all confusing marks or directions are removed. In its use experience will demonstrate the proper temperature for baking a given kind of food, and the hands on the indicator will

The Standard Oven Indicator.

mark the point on the graduated scale that is due to the temperature at which the baking is done. In future for similar work it is only necessary to see that the hand of the indicator reaches this point to know that the oven is ready for baking. The draft of a chimney will vary on different days and the operation of the stove will vary with it, and without an indicator to show the condition of the oven it has been the experience of many good cooks that the baking has been overdone or underdone. In construction the thermometer is described as free from complicated parts. The connection between the metallic thermal strip and the hand is direct, so that the motion is smooth and even, and it is pointed out that it is almost impossible for the hand to stick. The dial is enameled on copper, so that it is very durable. The indicator is about 3 inches in diameter and the dial is covered with glass. The case inclosing the sensitive parts is provided with lugs at each side for fastening to the oven door, the sensitive parts being placed inside the oven. It is necessary to cut an opening in the oven door through which the dial extends. This portion of the indicator is nickel plated, giving it an attractive appearance. It is pointed out that when the hand of the indicator reaches the word "hot," the oven is usually ready for baking. The exact position of the hand on the hot section of the dial at which the oven will do the best work for cooking, or the portion where bread bakes the best or turkey can be roasted to a turn, are points for each cook to decide with the stove on which it is used. These thermometers are used on the stoves of a number of New York and New England stove manufacturers and are said to have proven a very convenient attachment.

P. & W. Stove Pipe Fastener.

In the accompanying illustration we show the P. & W. stove pipe fastener, which is being put on the market by Powers & Williams of 401 East Main street, Streator, Ill. It consists of a stout wire and a heavy piece of sheet



The P. & W. Stove Pipe Fastener

metal. In use the directions state that the sheet metal should be turned in at the end of the pipe that goes into the chimney, with the end of the wire rod C turned down. When the pipe has been put into the chimney the proper distance, the wire should be given a half turn at A and pulled out until the end at B C is tight against the inside of the chimney. A fine piece of wire should then be run from A around the stove pipe elbow to hold the wire fastener in place. After the collar on the stove pipe is properly adjusted the sheet metal strip should be bent up with an offset to prevent the stove pipe from being pushed further into the chimney. The use of this fastener prevents the stove pipe being pulled out or falling in case of a severe jar, and also prevents the pipe being pushed so far into the chimney as to cut off the draft. Circulars giving full description and prices can be secured on application.

ODD PLATES.

M. D. Story & Sons, 121 Lake street, Chicago, Ill., have received the contract from George B. McKinney, Winnetka, Ill., to heat his large residence with a No. 159 Palace Queen Combination Heater, made by Russel Wheeler & Sons of Utica, N. Y.

Harry King, one of the representatives of Janes & Kirtland, 114 Beekman street, New York City, manufacturers of the Beebe Furnaces and Ranges, was a caller at *The Metal Worker* office this week.

Schill Bros., Crestline, Ohio, announce in another column, where they show a cut of their Steel Range, that for the convenience of the Northwestern trade they carry a stock with and have appointed Crandall & Nellson, Owatonna, Minn., distributing agents, so that the trade in Minnesota, North Dakota and South Dakota may have their orders filled promptly by addressing Crandall & Nellson Schill Bros. report the best trade they have ever enjoyed, and they have been compelled by increasing business to make an addition to their molding room, which has just been completed.

The New Magic Welcome Range is the up to date presentation of a Range that has been sold by thousands, which progressive dealers are invited to investigate. It is made by the Syracuse Stove Works, Syracuse, N. Y., with the A. J. Lindemann & Hoverson Company, Milwaukee, Wis., as Western agents. The claim is made that it will prove a bread winner to the dealer who sells it. A cut is shown in the advertising columns, and correspondence is invited.

According to latest advices Baldwin & Graham, New Castle, Pa., are giving employment to 110 men, 61 of whom are in the molding room. The latter is a powerfully built structure with roof so strongly girded that no supporting columns are used in its 20,000 feet of floor space. The mounting room is also of good size, being 235 x 60 feet in area. Every part of the work of making the well-known Good Luck Stoves and Ranges is done at this foundry except the nickeling of the trimmings. The company are said to be meeting with a very good demand for their Good Luck Gas Ranges.

A *Metal Worker* representative was recently shown a photograph which was suggestive of extremes in the Stove trade. The photograph showed J. W. Bogle of Dalton, Ga., and Franklin A. Thompson of Philadelphia, both salesmen of the firm of Chas. Noble & Co., Philadelphia, apparently deeply engaged in a discussion of the merits of Iron King Cook Stoves. The odd part of the picture is the disparity in the sizes of the two gentlemen, Mr. Bogle being 6 feet 2 inches in hight and Mr. Thompson 4 feet 11 inches. Their friends entitle the picture "The long and the short of it."

Chas. C. Heath & Co., Baltimore, Md., report very large sales of their new National Furnace, which, they state, is exceedingly gratifying to them in view of the fact that it was not brought out until the season was well advanced.

The Sheffield Stove Works of Sheffield, Ala., are meeting with a very gratifying demand for their Stoves, and are making frequent carload shipments to customers in various parts of the South. The demand for their Stoves is such that the company contemplate increasing their force as well as their output.

Charles O. Lyon, president of the Thatcher Furnace Company, 240 Water street, New York City, visited Boston this week in the interests of the Thatcher line of Heating and Cooking Apparatus.

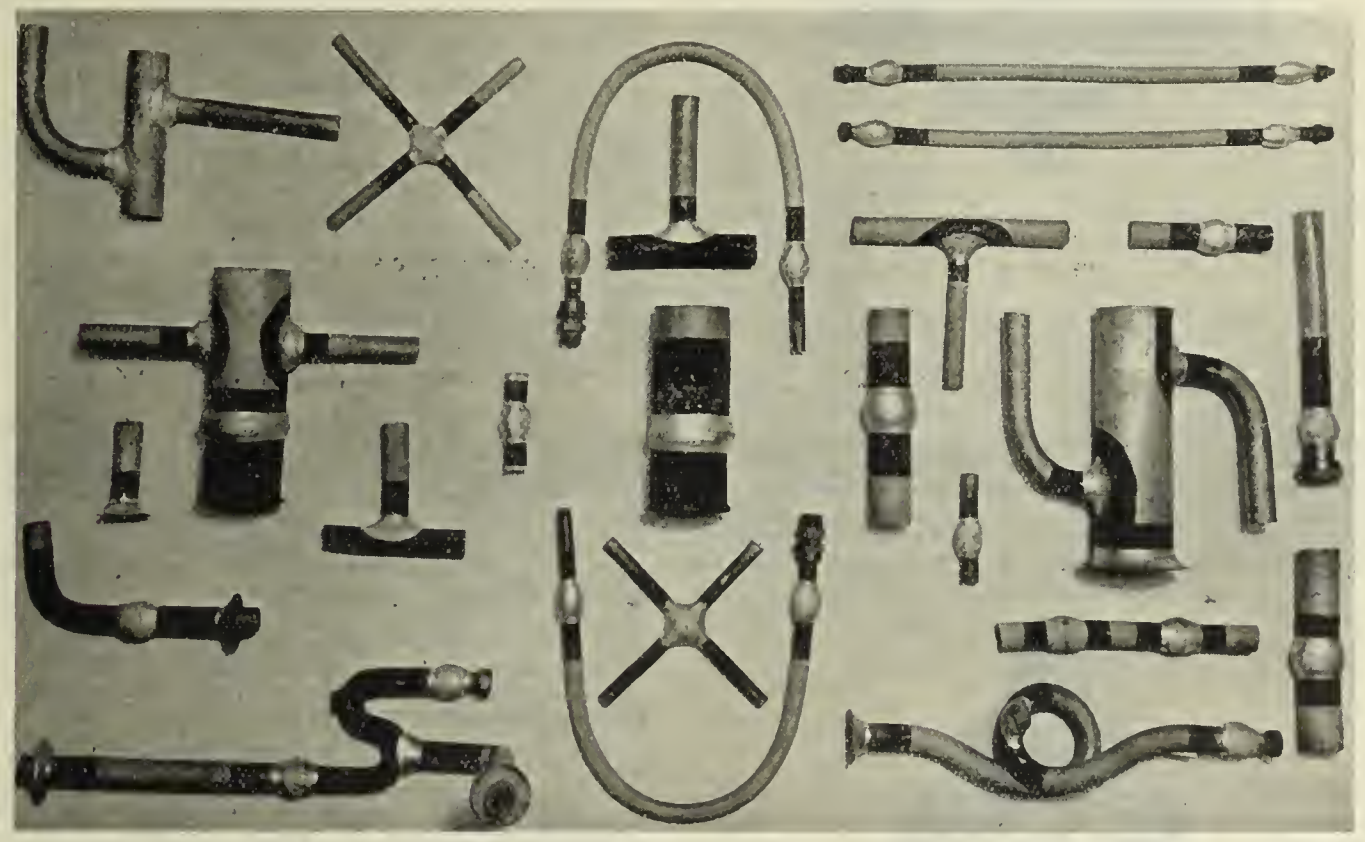
The City of Baltimore, Md., has an office—that of City Inspector of Furnaces—which seems to be ably filled by N. B. Shorey, who previous to his appointment had a long experience in the Hot Air Furnace business. Mr. Shorey has recently examined the school buildings of the city, and his report states that in a number of instances changes should be made to remove absolute danger and to secure a higher efficiency both for heating and improving the atmosphere in which the scholars must pass so much of their time.

Rathbone, Sard & Co. of Albany, N. Y., in recently resuming operations found it necessary on account of the rush of orders to open their shop No 2. This shop, we understand, has not been used since 1893. The goods which are being made are intended for the Eastern trade.

HEATING AND PLUMBING.

HILLYER INSTITUTE TRADE CLASSES, HARTFORD, CONN.

The fifth annual catalogue of the Hillyer Institute of the Young Men's Christian Association, Hartford, Conn., containing information concerning its evening educational classes for the season of 1897 98, has lately reached us. It contains, among other matters, full details regarding the good work that is being done at that institution for the young men of the city of Hartford in providing them with opportunities for trade instruction, which, although not claimed to be of so exhaustive a character as to make of the pupils finished tradesmen, yet is calculated to impart a sufficient knowledge of the principles of their trades to make better workmen of those already engaged in them, and to enable those not connected with any trade to learn enough to make their services of value to an employer.



Hillyer Institute Trade Classes, Hartford, Conn.—Specimens of Plumbing Work.

The trade courses taught at the institute embrace classes in plumbing, architectural and mechanical drawing, wood working, forging and electricity. The full course consists of two terms. The fall term began on Monday, October 11, and ends December 7, 1897. The winter term extends from January 10 to March 18, 1898. Each term includes 20 lessons, the classes meeting on two evenings of each week from 7.30 to 9.30 o'clock. Any young man over 16 years of age, of good character, is eligible for entry in the trade classes by becoming a member of the association, which costs $2 a year, and paying a further fee of $3 per term of 20 lessons. All the necessary tools are furnished free of charge.

We have had occasion in previous years to make particular mention of the excellent opportunities offered in the plumbing class of the Hillyer Institute. This class occupies a large room provided with work benches, gas furnaces, solder pots, and all the equipment necessary in the trade. It meets each Tuesday and Friday evening under the charge of Albert M. Smith. The instruction in the plumbing class is both manual and scientific. The manual instruction consists of making solder, wiping joints, sand bends, making traps, &c. The scientific instruction is given upon the proper arrangement of service and waste pipes and upon drainage and ventilation. The instructor has prepared a list of important questions which the students will copy into note books. He will give the answers to these and explain what is meant, after which they will be taken down for future reference. Last year's complete plumbing course was taken by 12 pupils who passed the required examination at its close. All but three of these young men belonged to Hartford, the others attending from nearby towns. The following is a list of the 1896-97 graduates :

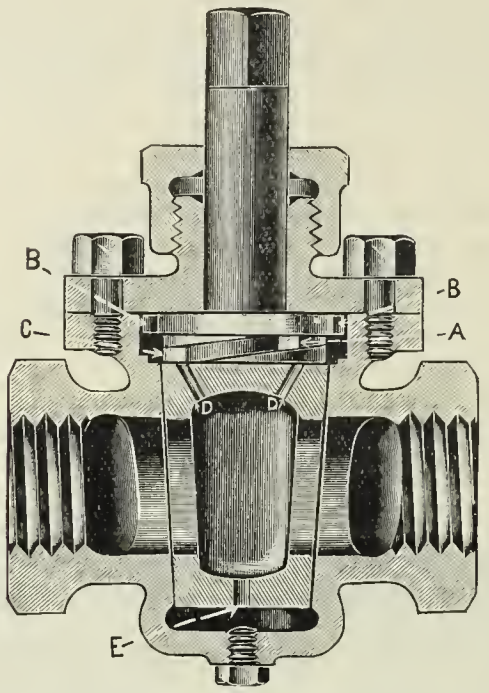
Avery, Arnold P. (South Manchester).
Burns, Edward A.
Dougherty, William.
Hills, John H. (East Hartford).
Hills, Rowland B.
King, William J.
Lindrey, William.
McMahon, M. F.
Moran, Michael.
Nordstrom, Peter A.
Trotter, Thos. (South Manchester).
Wapschal, Charles.

The progress made by these pupils is described as very creditable to them. The accompanying illustration shows examples of some of the work of the 1896-97 plumbing students. An exhibit of the work of the Hillyer Institute plumbing pupils, which was made last summer at the annual meeting of the American Manual Training Association, at New Haven, Conn., drew out many favorable comments.

Having accepted the position of Inspector of Gas Fixtures, Charles B. Gould has resigned from the Board of Examiners of Gas Fitters in Boston, Mass., and Marcus C. Poor has been appointed to fill the vacancy.

The Homestead High Duty Valves.

In the accompanying illustrations are shown the Homestead high duty valves, made by the Homestead Mfg. Company, Homestead, Pa., with Robert K. Story, 44 Centre street, New York, as Eastern agent. The valves are made straightway, three-way and four way for use under heavy pressure of steam, water or air. They are made of high grade material, and are sold for use under pressure from 100 to 4500 pounds per square inch. They are made from ⅛ inch to 3 inches, and larger sizes can be furnished to order. Friction and leakage in valve seats



The Homestead High Duty Valves —Fig. 1.—Sectional View of Straightway Valve, Showing the Homestead Construction.

are said to be obviated by the construction, the valve opening or closing by a quarter turn in the same direction as a globe valve. Balancing parts in the plug avoid resistance in operation. In construction the valve resembles the familiar plug cock, but is so arranged that when it is closed it is at the same time forced firmly to its seat, while when it is open the first effect of the movement to open it is to relieve the force which holds it to its seat and thus not only enable it to be very easily opened, but also preventing scored seats and leaks. This result is secured by means of the traveling cam A, Fig. 1, through which the

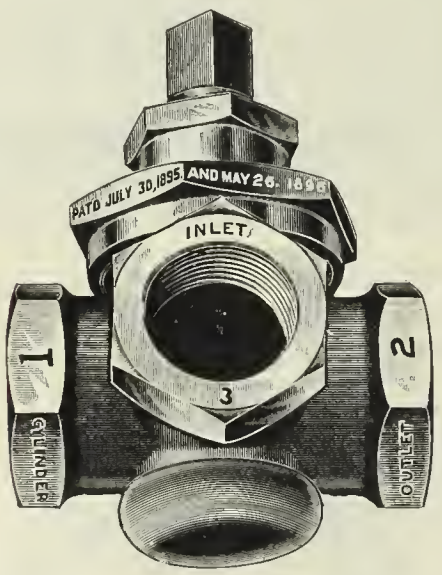


Fig. 2 —The Three-Way Valve.

stem passes. The cam is prevented from turning with the stem by means of the lugs B, which move vertically in slots. Supposing the valve to be open the cam will be in the lower part of the chamber in which it is placed and the valve will be free to be easily moved. A quarter of a turn in the direction for closing it causes the cam to rise and take a bearing on the upper surface of the chamber, and the only effect of further effort to turn the stem in that direction is to force the valve more firmly to its seat. A very slight motion in the other direction immediately releases the cam and the valve turns easily, being arrested at its proper open position by contact of the fingers of the cam at the other end of its travel. E D D are balancing ports. The bottom plug is for the purpose of draining valve to prevent freezing and also for the removal of sedi-

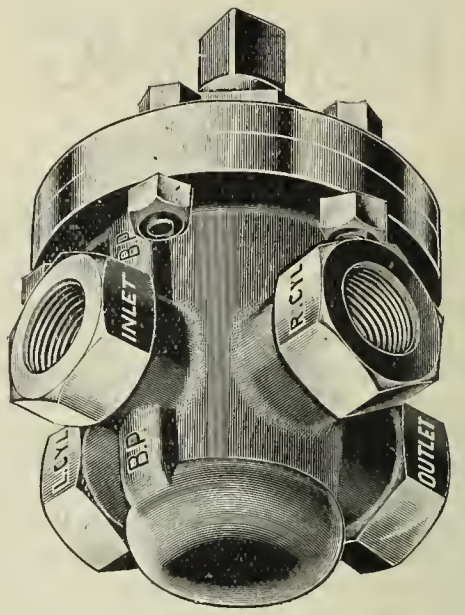


Fig. 3.—The Four-Way Valve.

ment. C indicates traveling cam. Under no condition, it is claimed, does the plug litt from its seat.

Plumbing Ordinance of Peoria, Ill.

The Mayor of Peoria, Ill., attached his name to the plumbing ordinance passed by the Council September 10, and the law will go into effect after the publication required by law. In view of the interest taken by the trade in this ordinance and the care that has been taken in it to secure an examination of plumbers, an inspection of plumbing and the regulations for sanitary work, we reproduce it herewith in full :

ARTICLE I.

Section 1. There is hereby created a Board of Examining Plumbers, which shall consist of the chairman of the Board of Health, who shall also be chairman of said Board of Examiners ; a second member, who shall be a master plumber, and a third member, who shall be a journeyman plumber. Said second and third members shall be appointed by the Mayor, by and with the consent of the City Council, at the first regular meeting of the City Council in the month of August, 1897, or as soon thereafter as may be, which appointees shall hold office until the first regular meeting of the City Council in May, 1898, and until their successors are appointed and qualified, and thereafter the term of office shall be for one year.

Sec. 2. Two members of said Board of Examiners shall constitute a quorum for the transaction of all business.

Sec. 3. It shall be the duty of the Board of Examiners to examine all applicants desiring to engage in the work of or business of plumbing, whether as master or employing plumber, or as journeyman plumber, as the case may be. Said board shall examine said applicants as to their practical knowledge of plumbing, house drainage and plumbing ventilation, and if satisfied of the competency of such applicants shall thereupon issue a certificate to each such applicant authorizing him to engage in the work or business of plumbing, whether as master or employing plumber or as a journeyman plumber, as the case may be. The fee for a certificate for a master plumber or employing plumber shall be $5, and for a journeyman plumber $1, which said feel shall be paid to the treasury of the city.

Sec. 4. Every person desiring to work either as a master plumber or as a journeyman plumber in said city of Peoria who has no license, shall apply to the Board of Examiners and procure a certificate before entering upon such work.

Sec. 5. Any person who shall engage in the work or business of plumbing, either as a master plumber or as a journeyman plumber, without having first obtained a license or certificate from a duly qualified Board of Examiners within the State of Illinois, shall be deemed guilty of a misdemeanor and be subject to a fine of not less than $5 nor more than $50.

Sec. 6. The Health Officer shall receive no extra compensation for his services as chairman of the Board of Examiners other than his regular salary as Commissioner of Health ; the master plumber and the journeyman plumber shall each receive $5 for each and every meeting of the board ; Provided that in case the Plumbing Inspector is a

member of the board he shall receive no extra compensation for his services thereon.

Sec. 7. The Board of Examining Plumbers shall meet on the second Tuesday of each and every month at the office of the Plumbing Inspector.

ARTICLE II.

Section 1. There is hereby created the office of Plumbing Inspector, who shall be appointed by the Mayor, by and with the consent of the City Council, at the first regular meeting of the City Council in the month of August, 1897, or as soon thereafter as may be, which appointee shall hold office until the first regular meeting of the City Council in May, 1898, and until his successor is appointed and qualified, and thereafter the term of office shall be for one year. The Plumbing Inspector shall be either a master or a journeyman plumber, and may be a member of the Board of Examiners of Plumbers.

Sec. 2. No person shall be appointed to the office of Plumbing Inspector who is not reasonably skilled in the business of plumbing, house drainage and plumbing ventilation, and who is not a resident of the city of Peoria and a citizen of the United States ; and hereafter he must hold a plumber's license when appointed

Sec. 3. Said Plumbing Inspector shall, before entering upon the duties of his office, execute a bond to the city of Peoria in the sum of $5000, with two or more sureties thereon, to be approved by the City Council of the city of Peoria, conditioned for the faithful performance of his duties, and take and subscribe to the oath prescribed for city officers.

Sec. 4. Said Plumbing Inspector shall not engage in the occupation of plumbing, house drainage or plumbing ventilation or be interested directly or indirectly in any firm or corporation engaged in the business of plumbing, house drainage or plumbing ventilation during his term of office. He may be removed for cause at any time by the Mayor.

Sec. 5. The Plumbing Inspector may, as far as necessary in the performance of his duties, enter in the daytime any building or premises in the city of Peoria.

DUTY OF INSPECTOR TO INSPECT.

Sec. 6. It shall be the duty of the said Plumbing Inspector to see that the construction, maintenance and control of the plumbing, drainage and ventilation of all buildings in the city of Peoria shall hereafter conform to and comply with the rules and regulations established by this ordinance.

INSPECTOR TO ISSUE PERMITS AND KEEP RECORD

Sec. 7. It shall be the duty of the Plumbing Inspector to sign and issue all notices and certificates required, to pass upon all plans submitted, to keep a daily record of his work, including all notices and applications received, permits granted, violations of these regulations and all other matters which may pertain thereto ; he shall inspect all houses in course of erection or undergoing alteration or repair as often as may be necessary, and shall see that all work for plumbing, drainage or ventilation is done in accordance with the provisions of these regulations, and shall collect all fees due said department.

PROPER BOOKS TO BE KEPT.

Sec. 8. The said Plumbing Inspector shall keep in proper books provided for that purpose a register of all transactions of said department, which said books shall be open to the inspection of the Mayor and the Comptroller and the members of the City Council at all times.

FEES.

Sec. 9. The Plumbing Inspector shall collect the following fees for all permits granted :

For each application for a permit in a new building or for alteration of existing plumbing, as follows :

When the estimated cost does not exceed $100 the fee shall be	$0.50
Over $100 and not exceeding $300 the fee shall be	1.00
Over $300 and not exceeding $800 the fee shall be	2.00
Over $800 and not exceeding $1,500 the fee shall be	2.50
Over $1,500 and not exceeding $2,500 the fee shall be	5.00

And for each $500 after the first $2500, the applicant shall pay an additional fee of 50 cents for each $500 of cost.

In case the owner, lessee or agent of any building in which plumbing has been placed prior to the passage of this ordinance, or after the plumbing of any building has been regularly inspected in pursuance of this ordinance, shall make application in writing to the Plumbing Inspector to have the same examined or inspected, it shall be the duty of the inspector, after the proper fee has been paid, to inspect said plumbing and furnish to such owner, lessee or agent a certificate showing the condition of the plumbing in such building, the fees for such inspection to be as follows :

In residences the inspection fee shall be $2.

In office, hotel or other public buildings of three stories or less, the fee shall be $3.

In office, hotel or other public buildings having more than three stories, the fee shall be $5.

In case the permit is refused for the reason that the proposed plumbing alteration or repair does not comply with the ordinances of the city the fee paid shall not be refunded, and in case changes are made in the proposed plumbing alteration or repairs so as to conform to the ordinances of the city only the one fee shall be collected. All of said fees shall be paid at the time the application for the permit is filed. All of said fees shall be turned into the treasury of said city.

INSPECTOR TO KEEP ACCOUNT OF FEES PAID.

Sec. 10. Said Plumbing Inspector shall keep an accurate account of all fees paid and required to be paid to him, giving the name of the party paying the same, the date paid and the amount of the fees.

INSPECTOR TO MAKE WEEKLY ACCOUNT TO THE TREASURER.

Sec. 11. Said Plumbing Inspector shall, on the last day of each and every week, pay over to the City Treasurer all moneys collected by him, and shall take a receipt and duplicate receipt therefor, and shall deposit such duplicate receipt with the City Comptroller, and shall render a report under oath each month to the said Comptroller of all moneys received.

SHALL KEEP HIS OFFICE—WHERE.

Sec. 12. Said Plumbing Inspector shall keep his office at such place as shall be designated by the City Council, and shall attend there for the transaction of the business of his office.

SALARY.

Sec. 13. The salary of the Plumbing Inspector shall be $100 per month.

YEARLY ACCOUNTING.

Sec. 14. The said Inspector shall at the end of each year prepare and present to the City Council a report showing the receipts and expenditures and entire work of his department during the full previous year ; he shall at the same time send to the Comptroller a full and comprehensive statement of all matters pertaining to the department, together with an estimate in detail for the appropriations required by the department during the succeeding year.

(To be continued.)

Albert Heckert.

Albert Heckert died at his residence, 106 North Queen street, York, Pa , last Saturday morning at the age of nearly 66 years, the immediate cause of his death being paralysis. For over 40 years Mr. Heckert followed the occupation of a tinner, and with the progress of the times took up the plumbing business, being a member of the firm of Heckert Brothers, tinners and plumbers, 20 East Market street. He took an active interest in local affairs, was a member of the Fire Department, and served in the City Council Chamber. He is survived by a widow and seven children.

Henry Ott.

Henry Ott, the vice president and secretary of the Ahrens & Ott Mfg. Company, Louisville, Ky., died at his residence, 1409 East Broadway, October 9. Mr. Ott's death was due to lock jaw, induced by an injury sustained from a fall when running to catch a street car. He was born in Würtemberg, Germany, in 1843, and was brought to this country at the age of eight years. He learned the plumbing trade, and finally became a manufacturer of plumbers' supplies, being connected with the Ahrens & Ott Mfg. Company at the time of his death. He was connected with a number of fraternal orders, and was buried with Masonic honors at the Cave Hill Cemetery, the pallbearers being the trustees of the First German Methodist Church, of which he was a member.

Plumbers in Syracuse, N. Y.

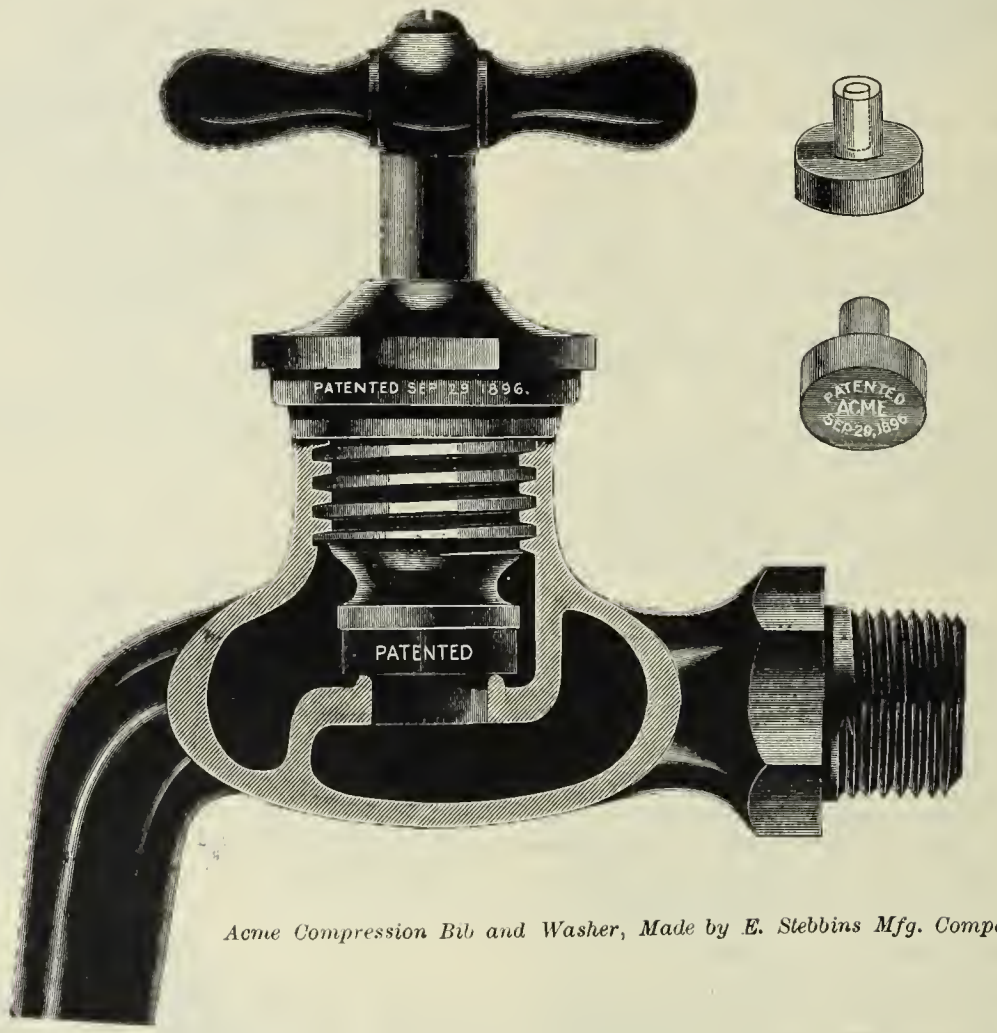
It is quite probable that some disagreeable competition would be removed it the plumbing laws of the State of New York were carried out in full, which is evidently not the case in Syracuse, for at a meeting of the Examining and Supervising Board of Plumbers and Plumbing of the city of Syracuse, N. Y., held October 5, 1897, the following resolution was duly adopted :

Resolved, That on and after January 1, 1898, all persons now conducting or intending to conduct the trade, business or calling of a plumber or of plumbing in the city of Syracuse, N. Y., must have passed the examination of the Examining and Supervising Board of Plumbers and Plumbing of the city of Syracuse, N. Y., and received a certificate of competency therefrom, as required by the New York State law.

In addition to the foregoing resolution, one member of the board called the attention of the board to the fact that out of 45 plumbers doing business in the city only 21 have fully complied with the State law. Twelve have received certificates of competency from the Plumbing Board, but have not registered with the Board of Health, and 12 more are doing business pending their examination. It will thus be seen that 24 plumbers are evading the law and making themselves liable to heavy fines.

Acme Compression Bib and Washer.

A new compression bib, known as the Acme, recently put on the market by the E. Stebbins Mfg. Company, Springfield, Mass., and attracting much attention among first-class plumbers, is illustrated herewith. The principal feature consists of a patent washer fitting closely into the spindle, but which cannot drop down owing to friction and length of the post. The washer is protected on top by a recess on the bottom disk of the spindle, and by moving easily within the socket gives the additional advantage of an adjustable seat. It is claimed that it never rattles under any circumstances, and is made of the best material for hot and cold water. Owing to the thickness and quality, it is claimed, it will outlast three or four times any ordinary washer of rubber or fiber. The bib is of a large full size pattern and the thread on all parts is of the United States standard. It is stated that it costs but a trifle more than the ordinary compression bib, and that prices and circulars will be forwarded to those who apply.



Acme Compression Bib and Washer, Made by E. Stebbins Mfg. Company.

New Jersey Plumbers' Convention.

A letter from John Campbell, 26 Lake street, Paterson, N. J., secretary of the New Jersey State Association of Master Plumbers, informs us that a convention of the Master Plumbers' Association of New Jersey will be held in Paterson, N. J., November 17, at Helvetia Hall on Van Houten street near Main. The committee in charge is John Campbell, chairman ; James McNab, Fred. Tattersall, Andrew Fielding and Thomas Wilson. The plumbers throughout the State, whether members of the association or not, are invited to attend in order to become acquainted with the object of the association and to associate themselves with the organization. The Paterson Association are preparing a "smoker" for the entertainment of the guests at the close of the convention.

Through what is claimed to be a misinterpretation of the Wisconsin plumbing law, the Board of Works of La Crosse have excluded the plumbing inspector and a master plumber to be appointed by the Mayor from the Plumbers' Examining Board, and in holding the plumbing examinations three of the oldest master plumbers in the city failed to secure a certificate of competency and have been denied licenses under which to operate their shops.

Changes in New York City Plumbing Regulations.

The Department of Buildings of New York City has printed in the City Record, in accordance with the law, and there is now in effect a set of rules and regulations for the plumbing, drainage, water supply and ventilation of buildings in New York City, which are practically the same as were printed in *The Metal Worker* of October 24, 1896. One change requires that water closets shall be set on a stone slab, and that sand or artificial stone will not be allowed. An important addition is as follows : "Wooden washtubs are prohibited. Cement or artificial stone tubs will be permitted, provided the same be made in the following manner—to wit, the cement or artificial stone to be 1 part good Portland cement to not more than 3 parts crushed or broken granite, gneiss or equally hard stone, broken to a size not larger than will go through a 1-inch ring, well tamped. Each tub to be branded with the manufacturer's name, and with the absolute mixture stamped on said tub, samples of which shall be filed and approved by this Department ; each compartment of the tub shall have a separate bottom outlet with a through and through fitting, and overflows shall be external to the tub."

American Society of Heating and Ventilating Engineers.

On Friday afternoon of this week a meeting of the Board of Management of the American Society of Heating and Ventilating Engineers was held in the office of President W. M. Mackay at 235 Water street, New York, when it was decided to hold the annual meeting of the Society on January 25, 26 and 27, 1898, in the rooms of the Society of Mechanical Engineers at 12 West Thirty-first street, New York, and arrangements to that effect are being made. At the meeting letters were read from ten of the leading members of the society announcing their intention to prepare a paper to be read at the annual meeting,

which already gives promise of being more interesting than any of the meetings hitherto held by the society.

NOTES.

The Vance Boiler Works, Geneva, N. Y., inform us that they are very busy on orders for the Vance Steam Heating Boilers, among which are a 40 horse-power boiler for the State Armory and an 80 horse-power boiler for the Waterloo Organ Company.

A Certificate of Excellence, awarded by the American Society of Florists at their convention at Providence, R. I., to the Scollay and Invincible Steam and Hot Water Heaters, hangs conspicuously on the walls of the office of John A. Scollay, 74 and 76 Myrtle avenue, Brooklyn, N. Y. The house is now busily engaged in filling orders that are coming in at this season.

A letter from Gunster & Forsyth, 327 Penn avenue, Scranton, Pa., informs us that the popularity of the Thompson S. P. Smoke Testing Machine is bringing in orders to such an extent that they are now making arrangements to greatly increase their producing facilities.

A plumber of Lewiston, Maine, has been brought before the courts of Auburn for doing plumbing work in Auburn without a license.

The City of Chelsea, Mass., will receive bids until October 26 for plumbing a ten-room graded school building on Washington avenue.

McLean & Keyes, Fred. Wild & Co. and Louis Gasser are prominent in the formation of a master plumbers' association at El Paso, Texas.

Mulligan & Schermerhorn have the contract for plumbing eight dwellings for Samuel O. Gleason, at Troy, N. Y.

William H. Day, who for some time has been foreman for J. H. & W. H. Riley, has bought the plumbing business of the late Frank S. Dibble, at Northampton, Mass., and will continue the business under the firm name of Day & Co.

Olcott & Heustis, Fonda, N. Y., have just completed the installation of a hot water heating plant in the residence of State Treasurer A. B Colvin, at Glens Falls, N. Y., using a No. 16 Sunray Heater and 21 Radiators. They are putting a similar system in the residence of R. M. Casler, at Fonda.

G. M. Conch, Hartford, Conn., has contracts for ten furnaces for houses which Nevels Bros. are building and two for Mr. Fried, and will use Howard Hot Air Furnaces.

Wm. Lumb & Co., Boston, Mass., under the charge of their Bar Harbor manager, William Pierce, are putting in a private sewer for several of the residents of West Gouldsboro.

An amendment has been offered to the ordinance recently introduced in the council of Cleveland, Ohio, for the addition of two plumbing inspectors to the present force. It provides that the inspectors be practical plumbers and not ordinary sanitary policemen. The ordinance was referred to a committee, which is also considering the amendment suggested.

James, Robert and Albert McClatchie have opened business on the old stand of Mr. Ruiter, at Sherbrooke, Quebec. They manufacture supplies for butter and cheese factories, Tinware, &c.

The Gorton & Lidgerwood Company, 96 Liberty street, New York City, inform us that one of their Gorton Side Feed Steam Heaters has been in use in the establishment of a large grocery firm in Newark, N. J, for the past 14 years, giving excellet service and with no expense beyond the original cost

The Noble, Johnson, Milne Company have leased the first floor and basement of the new Whittlesey Building on Cottage Row at Pittsfield, Mass, and intend to fit up a handsome showroom of Plumbing and Heating goods and to have a well equipped shop for doing first-class work promptly.

I. G. James, 48 Centre street, manager of the New York office of the Gurney Heater Mfg. Company, Boston, Mass., informs us that the James Steam Heating Company of Brooklyn will use a large size Bright Idea boiler for heating the Occidental Hotel, and that L. M. & J. T. White will use a large Bright Idea steam boiler for heating the Germania Theatre.

W. M. Murphy has been granted a license as a registered plumber at Norfolk, Va.

The McLean Air Pump & Machine Company have hung out a handsome new sign at their new quarters, 67 Centre street, New York City. They have done a large business in Bicycle Air Pumps during the past season, and make in addition to it a variety of Hand and Power Pumps adapted for plumbers' use, and are making a specialty of Air Pumps and Compressor Tanks. They recently filled an order for an Air Compressor and Tank to be driven by electric power.

L. E. Smith, Gloucester, Mass., has secured the contract to do the plumbing and to furnish the heating apparatus for the fine new school house at North Weymouth. It is about a $6000 job and speaks well for the firm. Mr. Smith has recently taken a Boston office in Tremont Temple, which is conducted by his son, Herbert C. Smith, sanitary architect.

E. T. Weymouth of 235 Water street, the New York representative of W. M. Tobin, Syracuse, N. Y., announces that he has secured the contract for heating the six-story addition to the store of Bloomingdale Brothers of New York City. They will use coils for radiation, and the heating will be done by means of exhaust and live steam. They will also install the necessary pumping apparatus to return the condensation to the boilers. Mr. Tobin is also heating the Hotel Gotham, using a Royal steam boiler and the Standard radiators.

An account of some primitive plumbing is given in the report of the State Board of Health of Vermont upon the causes of the outbreak of diphtheria in Bellows Falls. It criticises the systems of plumbing found in a number of dwellings where diphtheria has been, and suggests the immediate change of plumbing to conform with the regulations of the board. It is understood the board found a number of dwellings where the only method of flushing the closets was by water drawn from the faucets at the kitchen sinks and poured into the closets.

Fred. Groenewold, Napoleon, Ohio, was a visitor in New York this week consulting with W. M. Mackay on heating the Indian School at Mount Pleasant, Mich, in which boilers of 150 horse-power will be used and 10,000 feet of radiation, a portion of which will be of the direct indirect type. This work was secured by Mr. Groenewold in connection with Thomas Manion, of Manion Brothers of Toledo, Ohio.

The Cullen & Stock Heating & Ventilating Company, St. Louis, Mo., have filed articles of incorporation with a capital stock of $10,000, all paid. James J. Cullen holds 49 shares; C. A. Stock, 49 shares, and Phil. Stock, 2 shares.

"Steel Plate Fans" is the title of Catalogue No. 96, issued by B. F. Sturtevant Company of Boston. The steel plate fan is to-day recognized as the standard type for all general purposes of ventilation, heating and mechanical draft, where a large volume is desired without excessive speed or pressure. The catalogue before us is devoted exclusively to the illustration and description of fans of this type. It was evidently impossible to present all of the numerous special designs built by this company, but enough are shown to at least serve to suggest the possibilities of adaptation to special conditions. Their large number of specially designed engines of over 50 styles and sizes leaves them free to select in each case the one best suited to the requirements. Especial attention is called to the various forms of steel plate electric fans, which are constantly finding new adaptations as the use of electricity as a motive power is extended. Among the numerous useful tables pertaining to fans and their operation are several here presented for the first time. They are based upon the most recent investigations and calculations, and are as follows: Velocity, volume and horse-power required when air under a given pressure in ounces per square inch is allowed to escape into the atmosphere; velocity created when air under a given pressure in inches of water is allowed to escape into the atmosphere; hight of water column in inches corresponding to various pressures in ounces per square inch; pressures in ounces per square inch corresponding to various heads of water in inches; revolutions of fan wheel of given diameter necessary to maintain a given pressure over an area which is within the capacity of the fan; influence of the temperature of air upon the conditions of its movement; pressure and horse-power lost by friction of air in pipes; weights of air, vapor of water and saturated mixtures of air and vapor of different temperatures under the ordinary atmospheric pressure of 29.921 inches of mercury; the number of square inches of flue area required per 1000 cubic feet of contents for given velocity and air change; flue area required for the passage of a given volume of air at a given velocity. This table gives the volumes from 100 to 1000 cubic feet at speeds from 300 to 3100 feet per minute.

In the Federal Court at Chicago last week Judge Showalter handed down a decision in the case of Pilsbury *et al. vs.* H. R. Engle, which is of importance to other interests besides those engaged in the milling industry. Judge Showalter holds that because a certain line of goods is made in a certain place it does not give to the makers the right to a trade-mark in the name of that locality. The decision completely upsets the claims made by the Minneapolis millers, who asserted a vested right to the use of the word "Minneapolis" as a brand of flour.

SHEET METAL WORK.

PATTERN FOR ELBOW WITH THREE OPENINGS.

A correspondent writing from North Carolina wishes us to describe in *The Metal Worker* a method of developing the patterns for an elbow with three openings, the form being as shown in his sketch, which we reproduce in Fig. 1, in which A B C D E shows the elevation of the two arms, with vertical openings 11 inches in diameter at the bottom, joining into one horizontal opening 14 inches at the top, joining together at right angles, as shown in plan by F G H I J K.

In this connection it may be proper to remark that no matter how many pieces are contained in the elbow, or at what angle it is set in plan, the principles hereinafter shown are applicable to any case. Let A B C D E F G H in Fig. 2 be the side view of an elbow having three pieces

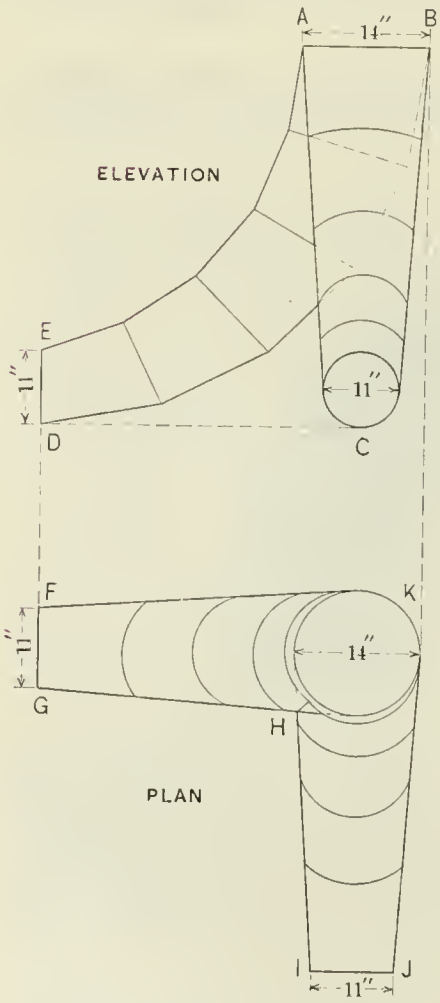


Fig. 1.—Reproduction of Sketch of Correspondent.

obtaining the patterns for the various sections to obtain profiles or sections on the miter lines A H, B G, C F and

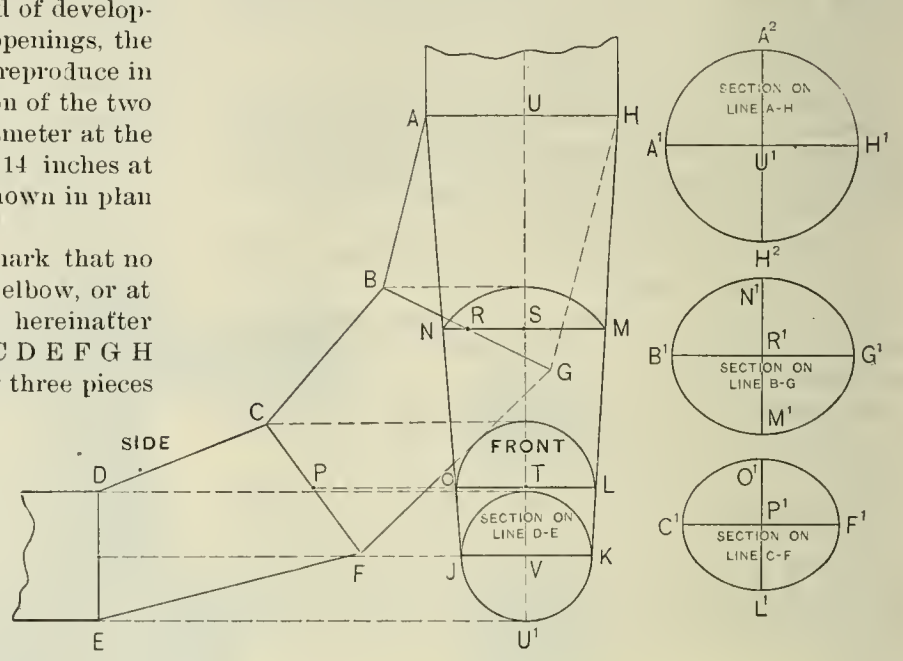


Fig. 2.—Elevation of Elbow, Showing Method of Obtaining Sections on Miter Lines.

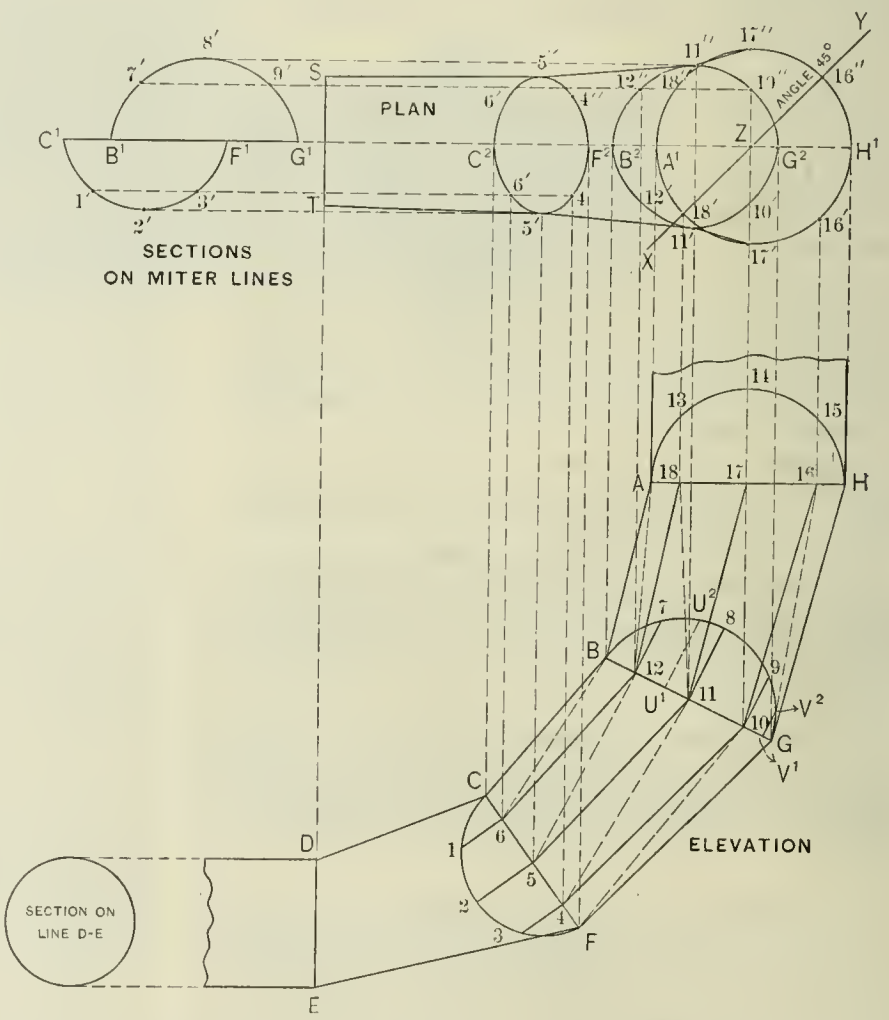


Fig 3.—Plan and Elevation, Showing Method of Obtaining Miter Lines in Plan.

PATTERN FOR ELBOW WITH THREE OPENINGS.

tapering, as shown, the front view being indicated by A J K H.

As the elbow is tapering, it will be necessary before D E, for which proceed as follows : Bisect the miter lines, as shown by the points U, R and P, respectively. Now at right angles to the center line U U¹ in front view, and

from the points R and P on the miter lines, draw lines intersecting the sides of the elbow in front, as shown by N M and O L. As the sections or profiles through C F and B G will be ellipses, the lengths and widths of which are given, construct them as follows : Draw any horizontal line, C^1 F^1, equal in length to C F in side view ; bisect C^1 F^1 by P^1; through P^1 at right angles to C^1 F^1 draw the line O^1 L^1, equal in length to O L in front view, making T O and T L in front view equal to P^1 O^1 and P^1 L^1, respectively. Through the points C^1 O^1 F^1 L^1 draw an ellipse by any method most convenient, which will be the section on the miter line C F in side view. In the same manner draw any horizontal line, B^1 G^1, equal in length to the miter line B G ; bisect B^1 G^1 by R^1, and through R^1 draw a line at right angles to B^1 G^1, making R^1 N^1 and R^1 M^1 equal to S N and S M in front view, respectively. Draw an ellipse by any convenient method through the points N^1 B^1 M^1 G^1, which will represent the section on the miter line B G. The section on the line A H at the top will be a true circle, whose diameter is equal to A H, the section being shown by A^2 A^1 H^2 H^1. The section on the line D E at the bottom is also a true circle, shown by T J U^1 K.

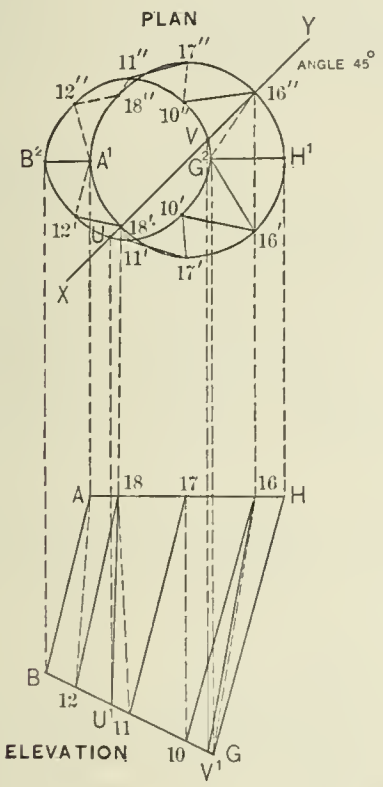


Fig. 4 —Elevation of A B G H, *Showing Triangulation*

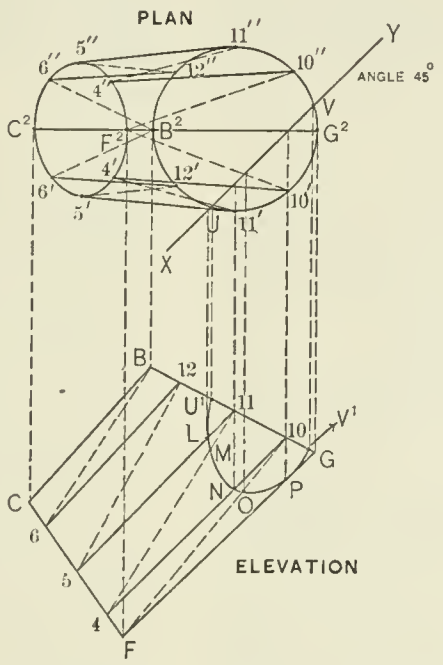


Fig. 5.—Elevation of B C F G, *Showing Triangulation.*

small figures 13, 14, and 15. At right angles to A H and from these points draw lines intersecting the miter line A H at 16, 17 and 18. Now draw solid lines from 6 to 12, 5 to 11 and 4 to 10, also from 12 to 18, 11 to 17 and 10 to 16, and dotted lines from 6 to B, 5 to 12, 4 to 11 and F to 10, also from 12 to A, 11 to 18, 10 to 17 and G to 16. Then will these solid and dotted lines show the bases, and the half profiles will show the hights from which to construct the several sections. Now in its proper position above the line A H draw the plan view of the top of the elbow, as shown by A^2 17′ H^1 17″, the circle being struck from the center point Z. Through the center point Z and parallel to A H draw the line C^1 H^1, then through the center point Z, at an angle of 45 degrees, draw the miter line or line of joint X Y, upon which the two branches of the elbow join at right angles, one branch only being necessary. Should

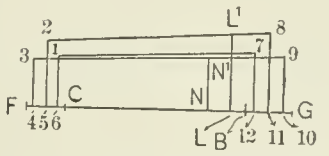


Fig. 6.—Diagrams of Sections on Solid Lines in B C F G *of Fig.* 3.

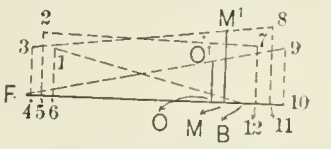


Fig. 7 —Diagrams of Sections on Dotted Lines in B C F G *of Fig.* 3.

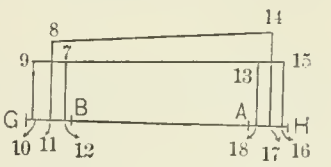


Fig. 8 —Diagrams of Sections on Solid Lines in A B G H *of Fig.* 3.

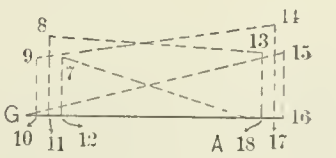


Fig. 9.—Diagrams of Sections on Dotted Lines in A B G H *of Fig.* 3.

PATTERN FOR ELBOW WITH THREE OPENINGS.

It will now be necessary to obtain the plan or horizontal view of the sections, showing where they will intersect the line of the joint X Y of Fig. 3. To obtain these miter lines in plan proceed as follows : Let A B C D E F G H in Fig. 3 be a reproduction of the same lettered figure in Fig. 2. Draw the miter lines D E, C F, B G and A H of Fig. 3. To the left of D E draw the profile or section, as shown. Take one-half of the section on the line C F, shown by C^1 F^1 L^1 in Fig. 2, and place it as shown by C 2 F on the line C F in Fig. 3. In the same manner take one-half of the section on the line B G, shown by B^1 N^1 G^1 in Fig. 2, and place it as shown by B 8 G in Fig. 3. The section on the line A H being a true circle, describe the semicircle A 14 H. Now divide the half profile C 2 F into equal spaces, as shown by the small figures 1 2 3. At right angles to C F and through the small figures on the profile C 2 F draw lines intersecting the line C F at 4, 5 and 6. In the same manner divide the half profile B 8 G into equal spaces, as shown by the small figures 7, 8 and 9. From these points and at right angles to B G draw lines intersecting B G at 10, 11 and 12. In similar manner divide the semicircle A 14 H, as shown by the however, the angle between the two elbows be other than a right angle in plan then the line X Y would have to be so drawn as to bisect that angle. To draw the plan view of the miter B G, take a tracing of the profile B 8 G and place it with the small figures on same on the center line C^1 H^1 in plan, as shown by B^1 8′ G^1. Now parallel to the center line C^1 H^1 and through the small figures 7′, 8′ and 9′ in the profile B^1 8′ G^1 draw lines, which intersect with lines drawn at right angles to the center line C^1 H^1 in plan from corresponding points 12, 11 and 10 on the miter line B G in elevation. Trace a line through points thus obtained, as shown by B^2 11″ G^2, which will show one half the miter line in plan ; trace the other half opposite with the various points on same, as shown by B^2, 12′, 11′, 10′, C^2, which completes the full miter line in plan.

In the same manner obtain the miter line in plan on the line C F in elevation. Take a tracing of the half profile in elevation C 2 F, and place it as shown by C^1 2 F^1 in plan. Parallel to the center line C^1 H^1 draw lines from the points 1′, 2′, 3′ in this profile, which intersect with lines drawn at right angles to the center line in plan from corresponding points in C F of the elevation, as shown by F^1, 4′,

5′, 6′, C² in plan. Trace a line through these points of intersections, as shown by C² 5′ F², which will represent one-half the miter line. Trace the other half opposite, as shown by C² 6″ 5″ 4″ F². Draw a line from 17″ to 11″, 11″ to 5″ and from 17′ to 11′ and 11′ to 5′. Now extend the line D E in elevation, as shown, and take one-half of D E and place it on either side of the center line in plan, as shown by S T. Then draw a line from 5″ to S and from 5′ to T, which completes the plan view of one branch of the elbow.

Having obtained the miter lines in plan on the various joints of the pieced elbow in elevation, it will now be necessary to obtain the elevation of the line of joint X Y in plan, upon which the two branches of the elbow are united. To do this proceed as follows : By referring to the plan it will be noticed that the line X Y cuts the section on the line A H in elevation at points 18′ and 16″, and cuts the section on B G in elevation at points between 10″ and G² on one side and 11′ and 12′ on the other. To avoid a confusion of lines, each piece of the elbow has been transferred separately. Thus in Fig. 4 A B G H, the section above same, and the miter line X Y are a reproduction of similar parts in Fig. 3. As B connects to A, 12 to 18, 11 to 17, 10 to 16 and G to H in elevation in Fig. 4, then in like manner connect similar letters and figures in plan, as B² to A¹, 12′ to 18′, 11′ to 17′, 10′ to 16′, G² to H¹, 16″ to 10″, 17″ to 11″ and 18″ to 12″. Now connect dotted lines in elevation, as 12 to A, shown in plan by 12′ to A¹, and A¹ to 12″; connect 11 to 18 in elevation, shown in plan by 11′ to 18′, and 11″ to 18″, and so on until all the dotted lines in plan and elevation have been drawn. Now wherever the line of joint X Y cuts these solid or dotted lines in plan perpendicular lines will be dropped intersecting similar dotted or solid lines in elevation, thus giving the line of joint in elevation. In this case, however, the line of joint does not pass any of the solid or dotted lines in plan, but only intersects the section of the top of the elbow at 16″ and 18′, and the miter line in plan on B G in elevation at V and U.

Now at right angles to A H in elevation and from points of intersections 16″ and 18′ drop lines which will intersect the points 16 and 18 on the line A H in elevation. In similar manner, at right angles to A H and from points of intersections V and U on the miter line in plan drop lines intersecting the miter line B G in elevation at V¹ and U¹. Draw a line, as shown, from V¹ to 16 and from U¹ to 18. Then will 18 U¹ V¹ 16 be that portion of the elevation which is to be cut from A B G H. For the miter line in elevation occurring in the elbow piece B G C F in Fig. 3 proceed in the same manner as in connection with Fig. 4. Let B G F C with its various solid and dotted lines, the plan views of the two sections on B G and C F in elevation, with their various figures plan in Fig. 5, be a reproduction of similar parts in Fig. 3. As C connects to B, 6 to 12, 8 to 11, &c , in Fig. 5, then connect similar points in the plan, as C² to B², 6′ to 12′, 5′ to 11′, &c., until all of the solid lines have been connected in plan to correspond with those in elevation. Now from the intersections between the solid and dotted lines in plan and the line of joint X Y drop lines at right angles to C² G² in plan until they intersect solid and dotted lines in elevation of similar numbers. Thus from the point V in plan draw a line intersecting the miter line B G in elevation at V¹; from the point of intersection on F² G² in plan intersect F G in elevation at P; from the point of intersection on the dotted line F² 10′ in plan intersect F 10 in elevation at O, and in similar manner from the points of intersection on the lines 4′ 10′, 4′ 11′, 5′ 11′ and U in plan intersect similar lines in elevation 4 10, 4 11, 5 11 and the miter line B G at N, M, L and U′, respectively. Trace a line through points of intersections thus obtained, as shown by U¹ L M N O P V¹, which represent the elevation of the line of joint X Y in plan.

The next step is to construct diagrams of sections on solid and dotted lines in elevation in Fig. 3. To do this proceed as follows: Draw any horizontal line in Fig. 6, as F G, equal in length to F G in Fig. 3. Now take the various lengths of the solid lines 4 10, 5 11, 6 12 and C B of Fig. 3 and place them as shown by 4 10, 5 11, 6 12 and C B in Fig. 6. Now from the various points 4, 5 and 6 draw vertical lines, making 4 3, 5 2 and 6 1 equal to 4 3, 5 2 and 6 1, respectively, in the section C 2 F of Fig. 3. In the same manner draw vertical lines from the points 12, 11 and 10 in Fig. 6, making 10 9, 11 8 and 12 7 equal in hight to 10 9, 11 8 and 12 7, respectively, in section B 8 G of Fig. 3.

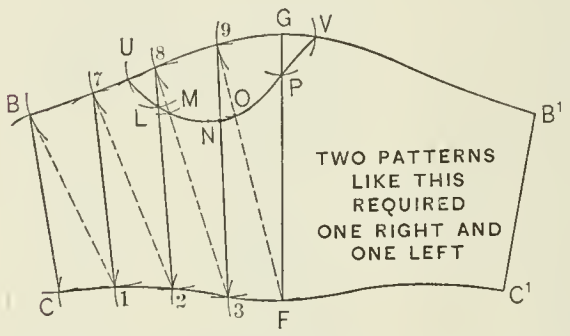


Fig. 10.—Pattern for Section of Elbow Shown by B C F G *of Fig. 3.*

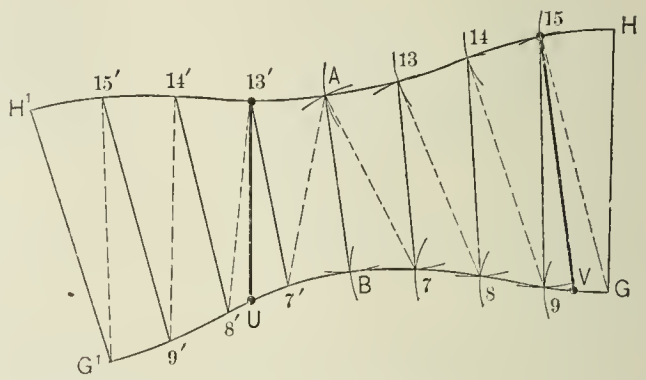


Fig 11.—Pattern for Section of Elbow Shown by A B G H *of Fig. 3*

PATTERN FOR ELBOW WITH THREE OPENINGS

Now connect the points in Fig. 6 by lines, as shown by 1 7, 3 9 and 2 8. Then will these diagrams represent the sections on solid lines in B C F G of Fig. 3. In the same manner construct the sections on the dotted lines. Draw any horizontal line, as F 10 in Fig. 7, making it equal in length to F 10 of Fig. 3. Now take the various lengths of the dotted lines 4 11, 5 12 and 6 B and place them as shown by 4 11, 5 12 and 6 B in Fig. 7. At right angles to F 10 and from the points 4, 5 and 6 draw lines, making 4 3, 5 2 and 6 1 equal to the hights in the section C 2 F of Fig. 3, as shown by 4 3, 5 2 and 6 1, respectively. In the same manner, from points 12, 11 and 10 in Fig. 7 and at right angles to F 10 draw lines, making 10 9, 11 8 and 12 7 equal in hight respectively to 10 9, 11 8 and 12 7 in the section B 8 G of Fig. 3. Now connect the various points in Fig. 7 by the lines B 1, 7 2, 8 3 and 9 F, which will represent the sections on the dotted lines in B C F G of Fig. 3. In the same manner obtain the sections on the solid and dotted lines in A B G H in elevation in Fig. 3, as shown in Figs. 8 and 9.

Having obtained all of these sections, the patterns will be developed as follows : For the pattern for that piece of the elbow shown by B C F G in Fig. 3 proceed as follows : Draw any vertical line, as F G in Fig. 10, equal in length to F G in Figs. 3 or 6. Now, with G of Fig. 10 as center, and G 9 in the section B 8 G, Fig. 3, as radius, describe the arc 9. Then with F of Fig. 10 as center, and F 9 of Fig. 7 as radius, describe an arc intersecting the arc 9. Then with F of Fig. 10 as center, and F 3 in the section C 2 F of Fig. 3 as radius, describe the arc 3. Then with 9 3 of Fig. 6 as radius, and 9 of Fig. 10 as center,

describe an arc intersecting the previous arc 3. Proceed in this manner, using alternately the spaces on the section B 8 G in Fig. 3, the upper lengths of the sections in Fig. 7, the spaces in the section C 2 F of Fig. 3 and the upper lengths of the sections in Fig. 6 until the last line, B C in Fig. 10, has been obtained. Trace a line through these points, and G B C F will be one-half the pattern for that piece of the elbow shown by B C F G in Fig. 3. Trace the other half of the pattern in Fig. 10 opposite the line G F, as shown by B^1 C^1. Then will B C F C^1 B^1 G be the full pattern. It will now be necessary to cut out from the pattern as much as is indicated by U N V to allow two pieces of this part of the elbow to miter on the line X Y in Figs. 3 or 5. To obtain this cut proceed as follows : From the various intersections of the miter line U^1 N V^1 with the solid and dotted lines in elevation, Fig. 5, take the various lengths 11 L, 11 M, 10 N, 10 O and G P, and place them upon similar base lines in Figs. 6 and 7, as shown. From the points thus obtained erect perpendiculars intersecting with the upper lines of the sections. Thus take the distance 11 L in Fig. 5 and place it, as shown, from 11 to L in Fig. 6. At right angles to 11 L and from L erect the perpendicular line intersecting the upper line of the section 2 8 at L^1. Now with 8 L^1 as radius, and 8 in the pattern of Fig. 10 as center, describe the arc shown at L. In similar manner take the distance shown from 11 to M in Fig. 5 on the line 11 4 and place it as shown by 11 to M on the line 11 4 of Fig. 7. At right angles to 11 4 and from M draw a line intersecting the line 8 3 at M^1. Now with 8 M^1 as radius, and 8 in the pattern of Fig. 10 as center, describe the arc M on the line 8 3. Proceed in similar manner for obtaining the points N, O and P in pattern. For the points U and V in pattern take the distances from 11 to U^1 and G to V^1 in Fig. 5, and place them, as shown, from 11 to U^1 and G to V^1 in Fig. 3. At right angles to B G and from points U^1 and V^1 draw lines intersecting the half profiles at U^2 and V^2. Now take the distances from 8 to U^2 and G to V^2 and place same, as shown, from 8 to U and G to V in pattern in Fig. 10 respectively. Trace a line through points U, L, M, N, O, P, V, which will be the desired miter line.

For the pattern for that part of the elbow shown by A B G H in Fig. 3 proceed in the same manner used in connection with the pattern in Fig. 10. Draw any vertical line, H G in Fig. 11, equal in length to H G in Figs. 3 or 4. Now with H in Fig. 11 as center, and H 15 in the section A 14 H in Fig. 3 as radius, describe the arc 15 in Fig. 11. Then with G 15 in Fig. 9 as radius, and G of Fig. 11 as center, describe an arc intersecting the previous arc 15. Now with G 9 of the half section B 8 G, Fig. 3, as radius, and G of Fig. 11 as center, describe the arc 9; then with 15 as center, and 15 9 of Fig. 8 as radius, describe an arc intersecting the arc 9 in pattern. Proceed in this manner, using alternately first the spaces in the half profile A 14 H of Fig. 3, then the lengths of the upper lines in the sections in Fig. 9, the spaces in the half profile B 8, G of Fig. 3, then the lengths in the sections of Fig. 8, until the line A B in pattern has been obtained. Trace a line through points thus obtained, as shown by H A B G in Fig. 11. Now place a duplicate of the pattern opposite the line A B, then will H^1 A H G B G^1 be the full pattern of that part of the elbow shown by A B G H of Fig. 3. It will now be necessary to cut away portions of the pattern in Fig. 11 to allow the mitering on the line of joint X Y of Fig. 4. To do so proceed as follows : Referring to the plan view in Fig. 4, it will be seen that the line of joint X Y cuts the upper section of the elbow at points 16′ and 18′; perpendicular lines dropped from these points cut the line A H in elevation at 18 and 16. Carry these points to the line A H in Fig. 3, as shown by 18 and 16. At right angles to A H and from points 18 and 16 draw lines intersecting the half profile A 14 H at 13 and 15. Mark off similar points in pattern, as shown by 13′ and 15 in Fig. 11. For the points U and V in pattern take similar measurements used in connection with the points U and V in pattern, Fig. 10. Take the distances shown from 8 to U^2 and from G to V^2 in the half profile B 8 G of Fig. 3, and place them, as shown, from 8′ to U and G to V respectively in Fig. 11. Then will 15 13′ U V be one-half the pattern for that portion shown in plan, Fig. 4, by 16″ V 18′ U, of which two patterns will be required. It should be understood that the line A B in Fig. 11 is shown by A^1 B^2 in plan, Fig. 4, and that the line G^2 H^1 in plan is shown by H G in Fig. 11, and the piece 13′ U V 15 in pattern is shown by 18′ U 12″ V 16″ 18″ in plan, Fig. 4. The pattern for the section C F E D, Fig. 3, will be obtained in similar manner as that in Figs. 10 and 11.

FLASHINGS.

J. C. McManus, Hartford, Conn., has just completed the metal balustrade and cornice, tin roofing and skylights on P. B. Smith's new block. He is also putting furnaces in the residences of W. C. Atwood and Judge Freeman and in two cottages for Watson Tryon.

The Penn Metal Ceiling & Roofing Company of Twenty-third and Hamilton streets, Philadelphia, Pa., have just established a branch office at 24 Pickering Building, Cincinnati, Ohio, under the able management of D. W. Pritchard, who has for many years been connected with the company, representing them both at home and abroad. Mr. Pritchard will give his exclusive attention to the sale of the Sagendorph Patent Metal Ceilings, Side Wall Finish and High Art Metal Relief Furnishings for interior decorative purposes in the territory tributary to Cincinnati, and other productions of the company which have been so long and favorably known to the trade.

The Dennison Rolling Mill Company, Dennison, Ohio, are getting ready to operate their plant. A new building 105 x 140 feet in area has been erected, which will contain a roll train, two Sheet mills with 40-inch rolls, one pair of cold rolls and two annealing furnaces. The output will consist of fine Sheet steel, cold rolled or pickled and cold rolled and stamping steel. A Black Plate mill will probably be added before long.

The plant of the Thompson Mfg. Company, Cleveland, Ohio, manufacturers of Corrugated Iron Roofing, was destroyed by fire on the night of October 18, with a loss to the owners, E. M. & C. M. Thompson, of about $25,000, partly covered by insurance. The Thompson Mfg. Company have operated the plant for 14 years and employed 25 men.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, manufacturers of Iron and Steel Roofing and Siding, are runing their factory to its utmost capacity, and have a very large amount of work on hand. This firm are making a specialty of their T. and C. Metal Lath and Buckeye Trough Floor for bridges and fire proofing purposes. and are in receipt of very large orders for these goods.

The stockholders of the Co-operative Sheet Mill, composed principally of former employees of the Scottdale Iron & Steel Company, Limited, at Scottdale, Pa., claim that $125,000 of the $150,000 of capital stock has been subscribed. The strikers state that they have taken $50,000 worth of the stock. It is the intention to put up a plant containing six sheet mills and a bar mill, but all arrangements have not yet been perfected for the building of the plant.

The Buffalo Corrugating Company, H. O. Wilson & Co., proprietors, 35 Washington street, Buffalo, N. Y., are equipping their factory with new and modern machinery for the production of a complete line of sheet metal goods in the way of Roofing, Siding, Stamped Steel Ceilings, Cornices, Skylight work, &c. The company state that their facilities will be such that in connection with the great railway advantages of Buffalo they will be in a position to make quick shipments and prompt deliveries to the trade, a feature which will be recognized and appreciated by those using their line of manufactured products. They are particularly prepared to make any kind of special work upon receipt of plans and specifications at reasonable prices. A circular which they have issued calls attention to the varied lines of goods manufactured, and to the fact that they employ skilled mechanics and guarantee their work.

A dilapidated pocketbook of the old-fashioned type in a plethoric state came in our mail recently, and on opening one end of it a check was found payable to any man finding a flaw in the work of the senders The check bears the name and address of Gara, McGinley & Co., 23 South Seventeenth street, Philadelphia, Pa., who make a specialty of Roofing and Architectural Sheet Metal work. Accompanying the purse is an addressed postal card and a letter stating that it is their custom in the fall to remind their customers that it is a good thing to look after their roofs. In a little circular, having on the front page the suggestion to "Do it right now to day," and on the back page a picture of a tinner at work on a roof, the assertion is made that more roofs are ruined by not making essential repairs than by hard weather. Their experience in the roofing business is reflected in the statement that they have roofed buildings from 12 feet square to those having 460,000 square feet, as was the case in the St. Louis, Mo., terminal train shed.

TIN PLATES.

A Shenango Valley Consolidation.

For some time negotiations have been under way by which the Shenango Valley Steel Company will take over the Neshannock Furnace, the New Castle Steel & Tin Plate Company and the recently organized Shenango Tin Plate Company. Arrangements have been completed by which the interests of these four companies will be consolidated, and the name retained will be Shenango Valley Steel Company, the capital stock being $1,500,000. Neshannock Furnace is one of the best equipped stacks in the Shenango Valley, and has a capacity of about 300 tons of iron per day. The plant of the Shenango Valley Steel Company is one of the most complete Bessemer plants in the country, having recently been extensively remodeled throughout. A bar mill is being added and the concern will be in the market as makers of sheet bars about January 1. The plant has a daily capacity of about 600 tons of billets. The plant of the New Castle Steel & Tin Plate Company, Incorporated, was originally built in 1892-93, and was put in operation in October, 1893. To this concern belongs the distinction of having one of the best equipped and the largest tin plate plant in the country. At present there are 20 hot mills, being a larger number than owned by any other individual tin plate concern. The plant has been very successful from the start, much of the success attained having been due to the administration of George Greer, president, and Charles Greer, secretary.

The Shenango Tin Plate Company have only recently been organized, but, as stated in these columns last week, the contracts for their buildings and most of their equip ment have already been placed. The order for the build ings has been given to the Shiffler Bridge Company of Pittsburgh, and that for the tin mill equipment to Mackintosh, Hemphill & Co. of that city. The mills will be driven by three twin and one single tandem compound condensing blowing mill engines, the contract for which has been placed with J. Wiedman Murray, manager of the Pittsburgh office for the Edward P. Allis Company, Milwaukee, Wis. The sizes of the steam cylinders in each of these engines are as follows : High pressure steam cylinder 25 inches in diameter, low pressure cylinder 50 inches in diameter, each 60-inch stroke. It is expected to have this plant ready for operation about April 1, 1898, although the work of construction may not be completed by that date, depending largely on the severity of the weather during the winter. This will undoubtedly be the largest individual tin plate plant ever built in this country or in the Old World.

The Neshannock Sheet and Tin Plate Company.

A third tin plate plant is likely to be added to the industries of New Castle, Pa. Application was made last week for a charter for the Neshannock Sheet & Tin Plate Company of New Castle by George W. Johnson, George W. Hartman, Charles H. Johnson, William K. Johnson and Wm. O. Kirkland. The company propose to convert the Arethusa Sheet Mills, at New Castle, which have been idle for some years, into a plant for the manufacture of black plate. Four mills will at first be built, but it is proposed to enlarge the works to an eight-mill plant in the near future. Black plate only will be turned out at the beginning, although it is the intention of the company to do their own tinning eventually. An addition to the present buildings is to be made for the cold roll and the pickling departments. It is expected that the plant will be ready for operation early in the coming year.

SCRAP.

At the present writing no less than 79 new Tin mills are either building or definitely projected for early erection. Of these there is a practical certainty that at least 65 will be in operation within six months from now, while the other 14 are more than likely to be finished by that time. Added to the 211 completed mills reported in our list on October 1, these additions would give the American industry a grand total of 290 mills. This means a capacity of considerably over seven million boxes a year. In addition, it is understood that quite a number of other Tin Plate enterprises are being considered, some of which are likely to materialize after the first of the year. The question is being asked by many in the trade : "Is not the building of new Tin Plate mills going to be overdone ?"

At the recent annual meeting of the Swansea Royal Metal Exchange, Swansea, Wales, Sir John Jones Jenkins, M.P., the president, in referring to the loss of trade to the United Kingdom brought about by the imposition of high tariffs in America, said that the Welsh Tin Plate industry had been affected to a greater extent than any other interest. Since 1895 the decrease in the shipment of Tin Plates to the United States had been very marked. In 1895 they had shipped 151,672 tons to the United States, but in 1897 only 41,000 tons. But they had increased their shipments to Batoum and St. Petersburg from 42,800 in 1895 to 50,039 tons in 1897. The increase to other Continental ports had also been satisfactory, having increased from 25,000 in 1895 to 43,000 in 1896, and to 53,000 in 1897. To the Straits Settlements they had sent none in 1895, but in 1896 they had sent 4000, and in 1897 12,000 tons. Although the decrease to the United States had been 44 per cent. from 1895 to 1896, and 51 per cent. in 1896 as compared with 1897, the increase to Russia and Continental ports had been 128 per cent. So they would see that their staple trade, although very unsatisfactory as regards the United States, had been encouraging in the increase of shipments to other countries. He wished that the improvement had been more rapid, in order to adjust the dislocation of trade brought about by the loss of such a large customer as the United States.

The officers of the new Shenango Tin Plate Company of New Castle, Pa., are Wm. Patterson, president ; John Stevenson, Jr., vice-president ; Wm. E. Reis, treasurer ; Rufus Patterson, secretary.

It is reported that some important additions and improvements are to be made in the plant of the Canonsburg Iron & Steel Company, Canonsburg, Pa., which will largely increase their output.

W. C. Brown, 36 La Salle street, Chicago, agent for the Reeves Iron Company, Canal Dover, Ohio, has issued an announcement that the company have resumed the operation of their Bar department, which had been shut down this entire year on account of unremunerative prices.

Work has been commenced on the erection of six additional hot mills at the Tin Plate plant of the Laughlin Nail Company, Martin's Ferry, Ohio.

The regular monthly statement of dutiable goods in the bonded warehouses of New York City shows that on September 30, 1897, 2,391,328 pounds of Tin Plate, valued at $53,575, were so held. On the corresponding date last year the amount was 4,617,188 pounds.

Great impetus has been given to the work of trade education at the Hampton Institute for Colored Youths, Hampton, Va., since the opening of the fine new Armstrong & Slater Trade School building there last fall. The management of the institute has been enabled to very materially widen and improve the character of the trade instruction since coming into possession of the facilities provided in the well equipped building. The attendance and the progress during the past season were very encouraging, and the trade school has now entered on its second year in its new quarters with a large number of scholars and excellent prospects. The theoretical work done in the trade school is supplemented by labor in the industrial shops of the institute, where the work is for purposes of production, the output going largely into use in the institute itself.

THE RETAIL STORE.

B. F. Guy & Co.

Every stove manufacturer or traveler who has visited Washington, D. C., within the past 25 years will bear evidence to the courtesy and the general good treatment received at the hands of B. F. Guy, senior member of B. F. Guy & Co., 1005 Pennsylvania avenue. Mr. Guy is to day the connecting link between the present stove generation and the generation before the war, and has had an honorable career in the stove and furnace business. Coming to Washington when a young man, in the year 1849, he clerked three years for a Mr. Woodward, a prominent merchant on Pennsylvania avenue in those days, and he was invited to become a partner in the year 1852. After a year's experience, not finding the partnership pleasant and satisfactory and all that it was represented to be, he took counsel and advice with a W. J. Sibley, a wealthy man then a resident of Washington. Mr. Sibley's advice was to secure an option on the business and to buy out Mr. Woodward's interest, which was done in 1855, Mr. Guy taking in as partner Mr. Johnson, a fellow clerk, the firm being known as Johnson, Guy & Co., the company being his adviser, Mr. Sibley. This partnership lasted only one year, being succeeded by Sibley & Guy, Mr. Johnson selling out his interest and leaving Washington. The firm of Sibley & Guy continued together from 1855 until 1868, being the largest and doing the most profitable business during those stirring years through the war.

B. F. GUY.

To convey to the present generation an idea of the magnitude of their business, Mr. Guy related to the writer that during the four years of the war the firm did a business of $1,600,000, an average of $400,000 a year, and, as stated by Mr. Guy, nothing could be bought but what could be sold—a great contrast to the conservative methods adopted during the present business depression. The firm were very successful, and both members having obtained a competence retired from the business in 1868, being succeeded by Mr. Simpson, who had been their bookkeeper for a number of years. Mr. Guy retired to the outskirts of the city, and spent a quiet life until the year 1880, when, being still a young man and restless for business, he bought back an interest in the old stand, and the firm were continued as Simpson & Guy until 1885, being then succeeded by B. F. Guy & Co., who have been continued down to the present time.

During this long period of years Mr. Guy has never moved, and he has seen many changes. He has seen a small city grow to the most magnificent city in the Union, and the capital of the greatest country on earth. He has bought particularly in all those years from Fuller, Warren & Co. of Troy, N. Y., being their recognized agent at Washington. High priced goods have always found a market in his salesroom, and any first-class goods, regardless of where they were manufactured, have always been taken hold of by the firm. Their methods have always been progressive and honorable, and it is a remarkable fact that during these long years of business Mr. Guy, whose portrait is presented herewith, has never failed to pay at maturity all of his obligations. The stove trade bears witness to his kindness, courtesy and fair treatment to all, and all wish him many continued years of business and prosperity at the old stand.

L. & G. Enameled Wares.

A new catalogue and price-list of 130 pages issued by the Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, relates to their Agate nickelsteel, Crystal steel, Peerless, blue and white and white enameled wares. The present edition of revised prices annuls all previous lists issued by the firm. It contains over 300 illustrations of enameled articles, many of which are new goods recently added to their assortment. Special attention is called to the patented Agate nickel-steel ware, and certificates from leading analytical chemists are presented testifying to the absence of any poisonous or deleterious substances in its coating. The Peerless ware is described as made of sheet steel covered with mottled gray enamel; the Crystal steel ware is of a grayish, color slightly tinged with blue, presenting a wave-like appearance, and the Blue and White ware is also of sheet steel coated with pure white porcelain on the inside and bright blue enamel on the outside. At the end of the catalogue is a handy alphabetical index. A tasteful little pamphlet, entitled "Kitchen Utensils," devoted to a description of the merits of Agate ware, and containing an extract from the *American Journal of Health*, accompanies the book.

MEMORANDA.

Allen Brothers, hardware merchants, at Snohomish, Wash., have opened a store at Skaguay, Alaska, where they are handling Hardware, Stoves, Tinware, &c., making a specialty of outfits for Yukoners.

A large line of Refrigerating Machinery, manufactured by the Newburg Ice Machine & Engine Company, Newburg, N. Y., is thoroughly described in a catalogue just received. These machines are made in capacities ranging from 10 to 50 pounds of ice per day for family use, up to the largest sizes intended for those industries requiring great artificial refrigeration.

Keen & Hagerty, Baltimore, Md., manufacturers of Tinware, Galvanized and Enameled Ware, have moved their offices and salesrooms to the large warehouse building, 16 West Baltimore street, in their city. This gives them commodious quarters in the heart of the city and on the principal street, and besides proving a convenience to them will also be an advantage which their customers cannot fail to appreciate. The rapid growth of their business is already creating a pressure upon the factory floor space, and the present removal of a prominent department will afford them some relief.

TRADE REPORT.

METAL MARKET.

Pig Tin.—There have been fairly large arrivals, via London for the most part, but these, as well as previous receipts this month, were well taken care of between deliveries on prior sales to consumers and replacing of stocks by dealers. Wholesale prices have moved up slowly but steadily, without the aid of anything in the nature of purely local speculative assistance, and they remain quite firm. The consumption has been, apparently, well up to the new supply, but whether it will continue to take up what London may supply, directly or otherwise, is conjectural. Jobbers' prices, also remain firm. Straits Pig in small lots from store is quoted at 14¾c. per lb.

Copper.—The market is in somewhat uncertain position at the moment. Home consumers are buying very indifferently, and export trade orders are not only below the late average in point of volume, but generally restricted at a lower level of prices. In other words, buyers' and sellers' ideas are at least ¼c. per lb. apart where business on a large scale is concerned. In a smaller way prices remain about at the level of a week ago. Small lots of Lake Ingot from stock are quoted at 12¼c. per lb., and Ansonia Grade Casting at 11¼c.

John Stanton reports the Copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 pounds :

	Reporting mines.	Outside sources.	Total U. S. product.	Product foreign mines.	U. S. exports
First half 1895....	70,612	9,100	79,712	42,484	34,215
Second half 1895..	84,885	6,600	91,485	43,674	30,507
Total 1895.....	155,497	15,700	171,197	86,178	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896..	95,314	7,200	102,514	43,941	67,287
Total 1896.....	199,494	14,400	203,894	86,196	125,503
First half 1897....	103,651	5,000	108,651	44,263	64,870
January, 1897.....	16,937	700	17,637	6,595	9,651
February.....	16,119	700	16,819	7,241	8,856
March.....	17,583	700	18,283	8,358	11,232
April.	16,554	900	17,454	7,318	10,279
May.....	17,805	1,000	18,805	7,116	12,175
June.....	18,653	1,000	19,653	7,635	12,677
July.....	14,244	1,100	15,344	7,327	13,728
August.....	16,309	1,100	17,409	6,963	10,971
September.....	16,343	1,100	17,443	7,541	10,980

Sheet Copper.—There is no material change to note in this department. The demand, while fairly liberal, is irregular, and in the aggregate is smaller in volume than in recent weeks. The mills are busy on orders, most of which, however, were placed some time ago. They hold comparatively few orders for delivery after the end of this year. Nor are they eager to book for deferred deliveries at the prices now ruling. Prices are referred to as firmer. For spot and early delivery 15c. per lb., basis, is a fair quotation for Sheet Copper in small lots from stock.

Pig Lead.—The weakness that had developed in the market at the date of our last review has become more pronounced. Heavy selling pressure has, in fact, been a conspicuous feature. Without counteracting buying for consumption, this had sufficient weight to carry wholesale prices down 2-5c. here and in the primary markets. On the break about 3000 tons changed hands, chiefly for near future delivery. Retail business has been dull. Dealers have reduced prices on small lots of American Pig to 4.35c. to 4½c. per lb. Bar Lead in small lots is quoted at 5c.

St. Louis advices are as follows: The bottom has completely dropped out of the Pig Lead market. The speculators have unloaded and large quantities were thrown on the market at prices ranging from 4.10c. down to 3.70c. The market is feverish, and producers are uncertain what the outcome will be. Consumers are holding off, anticipating a still lower range of prices, and there is hardly any doubt but what they will be accommodated.

Spelter.—A moderate business only has taken place here, and the demand is mostly of very indifferent character, with buyers seemingly satisfied to take a few carloads at a time. Good brands, in a retail way, rule at about 4.65c. to 4.75c. per lb. for Western.

St. Louis advices indicate an unchanged market there, with a fair amount of Spelter moving at the rates current a week ago. Buyers and sellers seem well satisfied with the present figure.

Sheet Zinc.—A quiet market is reported. The consumptive demand is of a very ordinary description, and prices show no variation. Jobbers quote 600-lb. cask lots at 5⅝c. to 5¾c. per lb. and smaller quantities at 6⅛c. to 6¼c.

Antimony.—Business has been only fair and prices are barely steady. Retail prices are reported on the basis of 8¼c. to 8½c. for Cookson's, 7¾c. for Hallett's and 7⅛c. to 7¼c. for Japanese in small parcels from store.

Nickel.—The market is steady, with sellers quoting 36c. to 38c. per lb. for small quantities.

Aluminum.—The demand is reported as fairly large. Present prices are as follows : No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb., 100 lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb., 100 lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb., 100 lb. lots, 30c. The Pittsburgh Reduction Company have withdrawn their quotation of 30c. per lb. for Scrap Zinc. The market value of Scrap is now not over 15c. per lb.

Tin Plate.—The week has been a decidedly quiet one in the Tin Plate market. Business was merely of fair volume. The close of the canning season has shut off the demand from that quarter and other large consumers are very indifferent. Were the demand at the present time at all active the market would be undoubtedly much stronger, as spot stocks are decidedly scarce. The difficulty experienced by the mills in getting Billets and Tin Plate Bars is more pronounced than ever, owing to the temporary stoppage of two of the producing plants, one on account of failure of water supply, and the other because of a strike. Consequently the Tin Plate makers are getting much behind in their deliveries on contracts. This causes little inconvenience to jobbers and consumers, however, in the present apathetic condition of the demand. Some weakness is noted in the market, especially in prices for future deliveries. In this line extremely low offers of American Plates are said to have been made here during the week. Jobbing business has been pretty active, except in Roofing Ternes, which sell very slowly. Jobbers' prices show little change, except in American Charcoal Brights for spot delivery, which are a little stronger. Quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows : American Coke Tins IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60 ; do., 100 lbs., $3.40 to $3.50 ; do , 95 lbs., $3.35 to $3.45 ; do., 90 lbs., $3.30 to $3.40 ; American Charcoal Brights, Melyn grade, IC, 14 x 20, $4.75 ; Allaway grade, IC, 14 x 20, $4.25 ; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are moving in a moderate way only. Purchases are mainly by packers of export goods. Prices are largely nominal.

Cleveland advices are as follows : Previous to the announcement of a large increase in Tin Plate capacity next year much work for 1898 was placed on the books. Mills are getting a premium of about 5c. a box on early deliveries.

A special London cable dispatch of October 20, 1897, reports on the British Tin Plate market as follows : "The Tin Plate market has been quiet, and prices are barely steady on the basis of 9s. 6d., f.o.b. Swansea, for ordinary 14 x 20 Bessemer Cokes."

Sheet Iron —The demand from mills continues quite heavy and for the same reasons which prevail among the Tin Plate workers—scarcity of Billets and Bars—there is still considerable difficulty in getting Black Sheets for prompt shipment. The prices recently established on Sheets are reported to be well maintained. Locally the demand is fairly liberal. Jobbers' prices are unchanged from the rates reported for the past few weeks—namely, 2.35c. to 2.40c. per lb. for No. 27 Common Black Iron, 2.65c. to 2.70c. for No. 27 R. G. cleaned and 75 and 10 and 5 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: Business continues to be quite good and orders were fully as large last week as they were the week previous. Store business in small lots was especially good. Quite a few mills are asking higher prices. Small lots from stock are selling at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—There is quite an active home demand, especially for Scrap Iron, and prices hold firm. Dealers are paying about the following prices for New York City delivery:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¼c.
Light Brass	per lb. 4¼c.
Lead	per lb. 3¼c.
Tea Lead	per lb. 2¾c.
Zinc	per lb. 2 c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4¼c.
Wrought Scrap Iron, per gross ton	$10.00 to $10 50
Heavy Cast Scrap, per gross ton	$9.00 to 9.50
Stove Plate Scrap, per gross ton	5.50
Burnt Iron, per gross ton	4.50

THE IRON MARKET.

The Iron market, in nearly all its branches, is undeniably considerably quieter. To a very great extent this is due to the fact that both sellers and buyers are committed for the balance of the year, and that in many lines the former are unwilling or unable to name figures for 1898 delivery. As a matter of fact, many in the trade hail the present halt in activity as a desirable development, since it puts an end for the present to any danger of an excited and unsound inflation of prices. Buyers, particularly of Pig Iron and Steel, claim that what figures are named for 1898 are altogether too high, judged from the standard of values of finished products. The latter, it is true, have hardened and have advanced a little, but that advance is not in proportion to the rise in Billets, for instance. They claim that it will pay them to hold off, particularly since the dull season of the year for the rolling mills is coming on.

It looks as though there might be a stand off for some weeks to come, during which the temper of both sides will be tested. Usually the producer has been at a disadvantage in deadlocks of this kind, but the fact that the best equipped and most active works are full of orders for months to come puts them in a position more than usually favorable. Prices thus far made are far from tempting to works who have been long idle, so that it will take a fresh rise before the ranks of competitors are swelled. The immediate future is assured, and it seems almost too early to worry over the first or second quarter of 1898.

Bessemer Pig Iron has been very quiet, while in Steel there is a momentary scarcity, caused by the stoppage of two works, which shows how close the Central West is working up to full capacity. In Foundry Iron, a slightly disturbing element has appeared lately in the form of offerings of Warrants at a concession. Some of these lots have found takers. The makers themselves are quietly maintaining their position.

Pig Iron.—In the New York market, buying has been limited in character. The larger consumers in the district are covered for some time to come. Some Warrants have been placed in this market, which were sold by a bank. The quantity involved was not large. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $11 to $11.25; No. 2, $10.50 to $10.75; No. 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

Reports in respect to the Philadelphia Pig Iron market are not all of the same character this week. Some are strong, some hesitating, some less confident than during the earlier portion of the month. Taking a broad view of the situation, however, it would seem that prices are steady to firm, although there is more Iron for sale than there was a week or two ago. Warrant Iron is offered rather freely, but consumers do not take to it very kindly unless at a pretty wide difference in prices. General quotations for seaboard deliveries are about as follows, with the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.50; No. 2 X Foundry, $11.25 to $11.75; No. 2 Plain, $10.75 to $11.

The furnaces in the Chicago district are all very firm in their views and are making no concessions. Prices on immediate business are firm, and on deliveries the early part of next year an advance of 25c. to 50c. per ton on some grades is named. The Southern furnaces are all asking that much more, and have refused business in the last week where the buyer did not want to pay the additional price asked. The foundries in the Chicago territory are getting busier all the time, and with the exception of the Architectural Iron and the small jobbing foundries are doing more business than they have for a long time before. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

The Pittsburgh Pig Iron market is very quiet, hardly enough Iron changing hands to establish a price. In spite of this prices are strong and there are no indications present of a slump. Foundry Irons are dull. We quote as follows, f.o.b. Pittsburgh: No. 1 Foundry, $10.50 to $10.75; No. 2 Foundry, $10 to $10.25; No. 3, $9.50 to $9.75; Bessemer, $10.40 to $10.65.

In Cincinnati the tone of the market has been quiet and firm, with energies directed more toward expediting deliveries than in securing new orders. The run of new business has been normal. The tonnage has been moderate, built up mainly of small orders, though with a sprinkle of 500 to 1000 ton lots. The outlook for the coming few weeks is a healthy one, and general quietude is expected. Not before December 1 is it expected that there will be another active buying movement. Northern Irons have been fairly active, and at about previous quotations are fairly strong. Prices on Southern Pig are nominally unchanged. Furnaces are, in the main, holding firmly to the maximum quotations. There is, however, a good sprinkle of speculative holdings which are being offered at inside figures, and this makes the market a little irregular. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

CHICAGO REPORT.

Scrap.—Old material is being sold as fast as it can be obtained from sources of supply. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$7.50	....
Machinery Cast	7.00	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c.	2.50	....
Old Boilers—whole (Iron)	3.00	....
Old Boilers (Iron)—cut in single Sheets and Rings	7.00	....
Old Gas Pipe and Boiler Tubes	6.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	9.50	....
Copper Wire and Heavy	....	10 c.
Copper Bottoms	....	9 c.
Copper Clips	....	9¾c.
Red Brass	....	8 c.
Yellow Brass	....	7 c.
Light Brass	....	4 c.
Pipe Lead	....	3.60c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	¾c.

Anthracite.—Business is dull. The price on carload lots of 12 tons minimum is now as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill.	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8 60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

Frederick Haberman, of the Haberman Mfg. Company, is the regular Democratic nominee for Alderman of the Twenty-ninth District, New York City.

THE HARDWARE TRADE.

The business conditions have not materially changed during the past week. Trade moves along in good volume, for the most part at steady prices. The demand is, however, somewhat uneven, being interfered with to some extent in the South by apprehensions in regard to yellow fever, and in some parts of the West by the exceptional drought which has prevailed. The disturbing influence of these causes will, it is hoped, soon cease, when a quickening in the demand is anticipated. From other parts of the country reports are encouraging, and notwithstanding the fact that orders are somewhat spasmodic, being many and relatively large for a few days, and then falling off in number and size, the outlook continues very satisfactory. With the coming of cold weather, which has been unusually slow in its approach, there will undoubtedly be a marked increase in the call for winter goods, and both manufacturers and jobbers will probably be taxed to their utmost to meet the demand. It is not unlikely that the trade who have deferred purchasing too long will have to wait in some cases for the execution of their rush orders. There is little new to report in the matter of prices. In some lines there is a good deal of cutting, and manufacturers have not as yet seen their way clear to announce advances which on general principles should be made. There is some complaint about collections, but the financial condition is on the whole excellent.

Advices from Chicago.—No material change has taken place in the condition of the Hardware trade during the last week. It is too late in the year to look for any increased business, unless caused by an advance in prices, which is not probable in general Hardware before January next. The country merchants generally are only buying to supply present demand, and are clearing the decks in anticipation of a heavy business next spring. Business in Heavy Hardware is decidedly more active than in Shelf Hardware.

Advices from St. Louis.—The Hardware jobbing trade continues to feel the effect of the late summer. Cold weather goods are extremely slow to move, and the manner in which retailers are holding off would lead one to the belief that there is to be no cold weather at all during the coming winter months. The result will be that with the first cold snap a rush of orders will be received and dealers will be greatly surprised because they do not get immediate shipment. The general tone of the market is excellent. More or less complaint is heard because manufactured goods have not advanced in proportion to the advance in raw material. The advances already made have been only moderate, and the market is all the better for it. Any radical advance in prices would check the demand very materially. Collections are quite satisfactory.

NOTES ON PRICES.

Wire Nails.—There continues to be a good demand for Nails and the market on the whole is in excellent condition. The demand, however, is a little spasmodic, and the market is not quite so active as some time ago. Prices remain as before. New York quotations are about $1.70 for small lots from store.

Advices from Chicago.—Orders for the past week have not been so many or as large in tonnage as previous to that date, which is a relief to manufacturers, who are buried under a lot of previous orders that will take the balance of this month to fill. All warehouses in the West are bare of stock. Very few orders are received from the South and Southwest on account of the yellow fever reports, business being practically at a standstill in that territory. There are current some reports of cut prices by jobbers on carloads, but manufacturers are adhering firmly to $1.60 to $1.65 for small lots from stock.

Advices from St. Louis.—The movement in Wire Nails is of moderate proportions. Jobbers and large retailers are carrying fairly large stocks, and while the demand is not particularly heavy there is no cutting in prices reported. Jobbers quote $1.65 to $1.70 base for small lots from store.

Cut Nails.—The arrangement between the manufacturers seems to be working smoothly. The demand, while not heavy, is at least fair and prices are well maintained. The New York price is $1.53 for less than carload lots.

Advices from Chicago.—There has been no change in the Cut Nail situation for some time and stocks in jobbers' hands are still small. Quotations are continued at $1.55 to $1.60 for small lots from stock.

Advices from St. Louis.—The movement in Cut Nails is not heavy and prices remain unchanged. Jobbers ask $1.45 base for small lots from store.

Barb Wire.—There is little change in the Barb Wire market, which is steady in the matter of prices, with a good but not especially heavy demand. Quotations continue unchanged.

Advices from Chicago.—Orders for the past week have fallen off in comparison with the last few weeks. Manufacturers are not finding any serious fault with this condition of affairs, as they are still crowded with work and have no surplus stock in hand. Presuming that the spring demand will be of great volume, they would welcome an opportunity to accumulate a stock for future delivery. Quotations are maintained at $1.60 to $1.65 for Painted and $1.90 to $1.95 for Galvanized, in small lots from stock.

Advices from St. Louis.—The demand for Barb Wire is not particularly heavy. The Texas trade, which is usually heavy during October, has been more or less disappointing. Jobbers report a fair trade at $1.65 for Painted and $1.95 for Galvanized.

Smooth Wire.—The market for Smooth Wire is in substantially the same condition as for the past week or two, and prices are well maintained.

Shot.—Under date October 18 the Eastern manufacturers announce reduced prices in Shot, as follows, there being the usual abatements for ton lots; terms, net cash 30 days, or 2 per cent. discount for cash in ten days:

Drop Shot, sizes smaller than B, per 25-pound bag	$1.30
" " " " " " " 5 " "	.30
" " B and larger sizes, per 25-pound bag	1.55
" " " " " " " 5 " "	.35
Buck and Chilled Shot, per 25-pound bag	1.55
" " " " " 5 " "	.35
Dust Shot, per 25-pound bag	2.00
" " " 5 " "	.50

The following prices are announced by Western manufacturers under the same date, terms as above:

Drop Shot, sizes smaller than B, per 25-pound bag	$1.20
" " " " " " " 5 " "	.30
" " B and larger sizes, per 25-pound bag	1.45
" " " " " " " 5 " "	.35
Buck and Chilled Shot, per 25-pound bag	1.45
" " " " " 5 " "	.35
Dust Shot, 25-pound Bag	2.00
" " " 5 " "	.50

Lalance & Grosjean Mfg. Company.—Under date October, 1897, Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, have issued a price-list of their Agate Nickel Steel and other Enameled Wares which they are manufacturing. Several new articles are represented in it. They call special attention in an introductory note to their Agate Nickel Steel Ware, alluding to its quality and the advantages it possesses from the way in which it is made. The following discounts are announced as applying to the various kinds of Enameled Ware which the company are putting on the market:

	Per cent.
Agate Nickel Steel Ware	40 and 10
Peerless Ware	70 and 10
Crystal Steel Ware	50 and 10
Blue and White Ware	50 and 10
White Ware	25 and 10

It will be observed that while the price of the Agate Nickel Steel Ware is maintained as before, a reduction in price is announced in the other wares.

Glass.—The American Glass Company have been perfected, according to reports, and only need a few finishing touches to arrange details and put in operation. The central idea of the new association is to have one agency to handle the output. All Glass is to be billed to the agency, and in this way it becomes the purchaser of all the output of the members of the association. Thus competition in selling is virtually done away with. It is probable that the association will control the sale of 95 per cent. of the Window Glass produced in this country. Little business is being done by New York jobbers, and prices range from 60 and 10 and 5 to 60 and 20 per cent. discount. Desirable orders accompanied by cash are reported as having been accepted as low as 70 per cent. discount.

Western jobbers of Window Glass at a meeting held at Chicago on Wednesday ordered an advance in prices of 5 per cent., to take effect at once, and notified the trade of another advance of not less than 5 per cent., to take effect November 1. Stocks of all the popular sizes of Window Glass in the West are said to be practically exhausted.

White Lead.—Orders for Dry White Lead have been fairly numerous, but not above the late autumn season average. Practically, the same remarks will fittingly apply to the movement of Lead in Oil. The price of base material has fallen considerably, or to the extent of about ¼c. per pound, but that corroders are influenced thereby is very doubtful. In any event list prices and terms remain unchanged, and indications are wanting of anything more than ordinary selling competition in this locality.

Red Lead.—A very fair business has been effected in both domestic and foreign makes, chiefly for future deliv-

eries, and about the usual movement in spot stock has taken place. Prices, however, have undergone very slight changes.

Linseed Oil.—Owing to the condition of the market for raw material and more temperate competition among crushers, wholesale prices of Oil made from American seed have been advanced 2c. The city brands are now quoted in small lots at 38c. for Raw and 40c. for Boiled.

Spirits Turpentine.—A sharp reaction in wholesale prices has taken place, owing to disarrangement of speculative deals, and retail prices have been marked down to 34c. to 34½c.

Old Rags, Paper, &c.—The market is fairly active for almost all lines of Paper Stock. Prices are still low, though with a stiffening tendency. Dealers' purchasing rates, New York City delivery, are about as follows:

No. 1 White Rags	per lb.	2⅝ to 2¾c.
No. 2 White Rags	per lb.	1¾ to 1⅞c.
Mixed Rags	per lb.	1 c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1½c.
No. 2 White Book Shavings	per lb.	¾ to 1 c.
Light Book Shavings	per lb.	½ to ¾c.
No. 1 Mixed Shavings	per lb.	¾ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1 c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to 3/5c.
No. 1 Manila Paper	per lb.	⅝ to ¾c.
No. 2 Manila Paper	per lb.	⅜ to ½c.
Bogus Paper	per lb.	⅜c.
Common Paper	per lb.	¼ to 3/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	½ to ¾c.
Hemp Twine	per lb.	1⅜ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	¾ to ⅞c.

Old Rubber.—The demand is quite good, especially for Rubber Shoes, and prices are decidedly firm. Local dealers are paying about the following figures:

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb	4 c.
White Syringes, per lb	4 c.

TRADE NOTES.

The Lynchburg Brass Mfg. Company is the title of a new concern who have been organized, with a capital of $20,000, to operate the plant formerly owned by the Maryland Brass Manufacturing Company of Aberdeen, Md. The entire plant will be moved to Lynchburg, Va., and is expected to be in operation in its new location before the end of the year. The new company will manufacture all kinds of Brass Goods The officers are John S. Slaughter, president ; William Hurt, vice-president ; E. O. Bayles, secretary and treasurer, and E. S. Whiting, general manager.

The Abendroth & Root Mfg. Company, New York, have booked a contract for the water works system at Siloam Springs, Ark., involving some 30,000 feet of 4, 6, 8 and 10 inch Abendroth & Root spiral riveted pipe. The value of the contract is nearly $10,000.

The National Tube Works Company have placed in front of their warehouse at the corner of Fulton and Clinton streets, Chicago, a typical industrial column which will attract as much attention as a monument. It consists of a full length of 30-inch wrought pipe, standing on end on a massive concrete base. It bears the following inscription in large gilt letters : "30-inch lap weld wrought pipe, with Converse patent lock joint, flanged, tested 800 pounds square inch, and the largest lap weld ever made in the world."

The Stirling Metal Company, Stirling, N. J., announce that they have secured the services of Dr. Herbert G. Torrey as consulting expert. Accompanying the announcement is a cricular calling attention to the Stirling Anti-Friction Metal, also the various grades of Babbitt metal, white brass, and car and journal boxes which they make.

An East Indian journal suggests that it would pay good American japanners to open a business in the large cities of India. To begin with, the bicycles that have to be repaired are villainously enameled by the native workmen. An enormous number of boxes of various sorts are already made in the country, including cash, dispatch, uniform and other boxes, and in every case they have an inferior coating. Japan coatings are of especial value in a moist climate like that of Bombay, which is so severe on iron and steel. These metals are being more used every day in the making of carriage wheels, and for these japan is the most suitable coating, being adhesive and easy to clean.

Marks Lissberger & Co. issue a notice to the trade stating that when they moved their office and works, formerly the New York Smelting & Refining Company, to their new building, 393-397 West Twelfth street, New York City, they thought their facilities would be more than ample. They found, however, that their business has grown so rapidly that they are already pressed for room, and have therefore leased for a number of years the Brooklyn Smelting & Refining Works, 375-383 Driggs avenue, Brooklyn, the former proprietor of which, Daniel Culbaine, will continue in charge.

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Metal and Miscellaneous Prices.

CHICAGO, OCTOBER 21, 1897.

Tin—

Straits pigs.....15¼@15½¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
C, 14 x 28		$7.25
X, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
X, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00

	Per box of 56 sheets.	
X, 14 x 56	21.00	$12.50
XX, 14 x 56	24.00	14.00
X, 14 x 60	23.00	13.50
XX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The followiug prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
S T P / L Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.90¢	2.50¢
17 to 20	2 00¢	2.60¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ¾ lb, A....$10.20 } 10%
Patent Planished, ¾ lb, B.... 9.20 } dis.
Craig's Polished Sheet Steel.....8½¢

Galvanized.

First quality.....dis. 80@80&2½%

Copper—*Ingot.*

Lake..... 12¼@ 12½¢
Casting Brands.....11¾@ 12 ¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ¾ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4½¢
Bar.....5¼¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead GalvanizedLapJoint80&25%
Double Bead GalvanizedSlipJoint80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized .....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne .....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 sqnare
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin.... ¾ square,	$4.75	$4.50
Galv..... ¾ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....¾ lb 2 ¢
" " Brown.....¾ lb 1½¢
" " Purple .....¾ lb 2½¢
" " Ground in oil, B. Red, ¾ lb 6½¢
" " Ground in oil, Red...¾ lb 6½¢
" " Ground in oil, Brown, ¾ lb 5½¢
" " Ground in oil, Purple, ¾ lb 6½¢
Linseed Oil, Boiled, in bbls.....37¢
Linseed Oil, Raw, in bbls.....35¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ¾ gal..... .34¢
Spirits Turpentine, in bbls., ¾ gal....35¢
Asphaltum, Trinidad Refined, ¾ ton. $45
Tarred Felt, 1 Ply, ¾ 100 lb.....$1.25
Tarred Felt, 2 Ply, ¾ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ¾ roll 108 sq. feet.....$1.25
Roofing Pitch, ¾ bbl. of 300 lb.....$3.00

NEW YORK, OCTOBER 22.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₽ lb, 40¢
100-lb lots.....₽ lb, 36¢
Aluminum Rods, from ⅛-in diam. to 1 in. diam.....₽ lb, 53¢
Aluminum Sheet, B. & S. gauge. In lots of 50 lbs or more.

	6-in. and 24-in.	24-in. and 30-in.
Wider than	₽ lb.	₽ lb.
Nos. 13 to 19	$0.40	$0.43
" 20	.42	.45
" 21 to 23	.44	.47
" 24	.46	.49
" 25	.47	.50
" 26	.50	.55
" 27	.53	.58
" 28	.53	.60
" 29	.58	.65
" 30	.66	.73

Note.—Lots of less than 50 lbs 5¢ ₽ lb extra.

Antimony—

Cookson.....₽ lb, 8¼@8½¢
Hallett's.....₽ lb, 7¾@8¢
Japanese.....₽ lb, 7½¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive	.38

35% off.

Copper & Bronze Tubing—

3¢ ₽ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₽ lb 18⅛@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₽ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₽ lb, 2.00	2.30¢
Nos. 17 to 21	₽ lb, 2.10	2.40¢
Nos. 22 to 24	₽ lb, 2.20	2.50¢
Nos. 25 and 26	₽ lb, 2.30	2.60¢
No. 27	₽ lb, 2.40	2.70¢
No. 28	₽ lb, 2.50	2.80¢
American B. B.		₽ lb, 4¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....₽ lb, 10¼@10½¢
Do. Stained.....6½@10¢
Patent Planished ₽ lb, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₽ lb, 8½¢

Galvanized.

Nos. 10 to 16	₽ lb, 12¢	75&10& 5% off.
Nos. 17 to 21	₽ lb, 13¢	
Nos. 22 to 24	₽ lb, 14¢	
Nos. 25 to 26	₽ lb, 15¢	
No. 27	₽ lb, 16¢	
No. 28	₽ lb, 17¢	
No. 29	₽ lb, 19¢	
No. 30	₽ lb, 21¢	

36 in. 1¢ ₽ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½@4⅝¢
Bar.....5¢
Pipe.....6¼¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....7¼¢. 20%
Old Lead in exchange, 3¼¢ ₽ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American.....@1½¢
Red Venetian, American.....@1¾¢
Liuseed Oil:
Raw, ₽ gal.....@38¢
Boiled.....@40¢
Spirits Turpentine:
In bbls.....34@34½¢
In cases.....42@42½¢
Putty:
In barrels and ⅛ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₽ lb 5 ¢
Clarified.....₽ lb 4⅞¢
Accra.....₽ lb 4¾¢
Half Jack.....₽ lb 4½¢
Cecilia.....₽ 100 lb $4.85
Choice Red.....₽ 100 lb 4.60
(*Spot Oil, ½c. ₽ lb higher.*)

Petroleum Products—

In Barrels (Barrel included).
Stove Gasoline.....₽ gal. 10@11¢
Kerosene.....₽ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
Wrought " " American Unions.....40%
" " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves..65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin Clamps.....60%
" " Plumbers' Joy, 50¢ ₽ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, 40&5%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanized Iron Range Boilers, Extra Heavy, above 52 gallon.....60%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guarauteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized 50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....55%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated.....40&10%
Solid Bronze.....25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%

1896 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₽ lb	₽ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₽ ton.....$30.00@$35.00
Asphaltum, Rock, ₽ ton.....$14.00
Coal Tar Felt, 1 ply, ₽ lb.....2¢
2 Ply Roofing, ₽ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₽ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₽ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.	₽ bbl.	$1.82@$1.83
Rosin, E. & F.	₽ bbl.	1.84@ 1.87
Rosin, G. & H.	₽ bbl.	1.90@ 1.95
Rosin, I. & K	₽ bbl.	2.00@ 2.05
Rosin, M. & N.	₽ bbl.	2.10@ 2.25

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₽ sqr		$3.75@$5.00
No. 1 Bangor Ribbon		3.35@ 3.75
Pen Argyle, ₽ sqr		3.75@ 4.35
Peach Bottom, ₽ sqr		4.75@ 5.60
No. 1 Chapman, ₽ sqr		3.80@ 4.80
Lehigh Slates, ₽ sqr		3.00@ 4.50

Vermont:

Sea Green, ₽ sqr		$2.50@$3.55
Purple, ₽ sqr		3.25@ 4.00
Unfading Green, ₽ sqr		3.75@ 4.50
Red, ₽ sqr		9.00@11.00

Solder and Soldering Fluids— Solder—

⅛&¼ guaranteed..... 10¾@11¢
No. 1..... 9¾@10½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₽ lb.....4¢
Smaller quantities, ₽ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₽ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₽ lb.....3½¢
½ bbls., about 300 lb, ₽ lb.....4¢
Kegs, about 110 lb, ₽ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₽ lb.....4¢
5% dis.

Yager's Soldering Salts.
⅛ lb bottles, each.....80¢
Large quantities, ₽ lb.....40¢

Soldering Coppers—

Per lb.....15½¢@17½¢ net

Spelter—

Western Spelter.....4.65@4¾¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₽ lb.....15¼¢
Straits, pigs, lb lb.....14¾¢
Straits, in bars, ₽ lb.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	10¢
95 lb	15
90 lb	20¢
85 lb	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating	8.00 @ 9.25
STP Grade, 10 to 12 lb coating	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....$9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₽ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20	$5.00
" "	IX,	14 x 20	6.00
Allaway Grade,	IC,	14 x 20	4.25
" "	IX,	14 x 20	5.00

Coke Plates, Bright—

Steel Coke,	IC,	14 x 20	$4.25
	IX,	14 x 20	5.25

Terne Plates—

MF, IC,	14 x 20	$6.37½
	20 x 28	12.60
Worcester Grade, IC,	14 x 20	4.25
	20 x 28	8.50
Dean Grade, IC,	14 x 20	4.00
	20 x 28	8.00
Gilbertson's Old Method, IC,	14 x 20	7.50
	20 x 28	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₽ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain	72%
1¼ and less, Galv	67%
1½ and larger, Plain	78%
1½ and larger, Galv	70%
Screw and Socket Joint Casing	65%
Inserted Joint Casing	60%
Boiler Tubes, 2¼ inch and smaller	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ₽ lb 5¾¢ | Per lb.....6¼¢

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Electric Oil Stove Co., Homer, Mich.
Wheeler, Russell & Son, Utica, N. Y.

Architectural Ornaments.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Souther, E. E. Iron Co., St. Louis, Mo.
Willis Mfg. Co., Galesburg, Ill.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Bake Pans.
Kieckhefer Bros. & Co., Milwaukee, Wis.

Baskets, Metallic.
Metallic Basket Co., Cedar Rapids, Ia.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Copper.
Randolph & Clowes, Waterbury, Conn.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Center St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Rhodes, Dickelman & Co., Forest, O.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.
Obdyke, W. A. & Co., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Crimping Machines.
Packham Crimper Co, Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, O.

Dampers.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co, Erie, Pa.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Ct.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.

Eave Trough Hangers.
Berger Mfg. Co., Canton, O.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 8-14 Grand St., New York.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Electric Oil Stove Co., Homer, Mich.
Wheeler, Russell & Son, Utica, N. Y.

Filters, Rain Water.
New Idea Filter Co., Muncie, Ind

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co. Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Excelsior Steel Furnace Co., Chicago, Ill.
Safety Furnace Pipe Co., Detroit, Mich.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D. Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Buckwalter Stove Co., Royersford, Pa.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Detroit Furnace & Heater Co., Detroit, Mich.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
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Fox, F. B., Cleveland, O.
Fox Furnace Co., Cleveland, O.
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Kelsey Furnace Co., Syracuse, N. Y.
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Mt. Penn Stove Works, Reading, Pa.
Richardson & Boynton Co., 232-234 Water St., N. Y.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Turner Heater Co., Bristol, Ct.
Union Stove Works, 70 Beekman St., N. Y.
Wheeler, Russel & Son, Utica, N. Y.
Wood & Bishop Co., Bangor, Me.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.

Galvanized Ware.
Sheuard, Sidney & Co., Buffalo, N. Y.
Keen & Hagerty, Baltimore, Md.

Galvanizing.
Gregory, Thos. Galvanizing Works, Brooklyn, N. Y.

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Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
Kieckhefer Bros. & Co., Milwaukee, Wis.
St. Louis Stamping Co., St. Louis, Mo.

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Jackson, W. Sons, 246 Front St., N. Y.

Grinding Mills.
Straub, A. W. & Co., Phila., Pa.

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Watrous & Co., Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill
Barstow Stove Co., Providence, R. I.
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Drake, W. H., Newark, N. J.
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Huse, Jos. & Son, Boston, Mass.
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Palermo Mica Co., 27 Peck Slip, N. Y.

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Hanson & VanWinkle Co., Newark, N.J.
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Clough, R. M., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.

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Wheeler, E. S. & Co., New Haven, Ct.

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Frink, I. P., 551 Pearl St., New York.

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Kernan Furnace Co., Utica, N. Y.
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Hill-Whitney Aluminum Co., Boston, Mass.
Shepard, Sidney & Co., Buffalo, N. Y.

Roofing, Asphalt.
Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Berger Mfg. Co., Canton, O.
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Burton, W. J. & Co., Detroit, Mich.
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Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Souther, E. E. Iron Co., St. Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Ct.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., East Bangor, Pa.
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Johnson, E. J. & Co., 38 Park Row, N. Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
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Toledo Mach. & Tool Co., Toledo, O.
Watrous & Co., Troy, N. Y.
West Mfg. Co., Buffalo, N. Y.

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Sheet Metal Work.
Willis Mfg. Co., Galesburg, Ill.

Sheets, Iron and Steel.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N.Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burden, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Skylights.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.
Watrous & Co., Troy, N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.
Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.
Adams Mfg. Co., Minneapolis, Minn.
Hoffman, Geo. W., Indianapolis, Ind.

Stove Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Berger Bros., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Lock.
Kerr, M. B., Winfield, Kans.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.
Parks & Parks, Troy, N. Y.

Stove Putty.
Connors, Wm., Troy, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Clark, Henry N. Co., Boston, Mass.
Hessler, H. E., Syracuse, N. Y.
Howes, The S. M Co., Boston, Mass.
Kieffer Bros., Syracuse, N. Y.
Knrtz, E. F., Phila., Pa.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Morris, J. L., Chicago, Ill.
Troy Nickel Works, Troy, N. Y.
Zeager, J. Elwood, Phila., Pa.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.

Stove Trucks.
Gwinner Mfg. Co., Cincinnati, O.
Howes, The S. M. Co., Boston, Mass.
Mersick, C. S. & Co., New Haven, Ct.
Warner Hardware Co., Freeport, Ill.

Stoves and Ranges.
Beckwith, P. D., Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Buckwalter Stove Co., Royersford, Pa
Bussey & McLeod Stove Co., Troy, N.Y.
Charter Oak Stove & Range Co., St. Louis, Mo.
Eclipse Stove Co., Mansfield, O.
Floyd, Wells & Co., Royersford, Pa.
Gem City Stove Co., Dayton, O.
Graff & Co., 208 Water St., N. Y.
Howes, The S. M. Co., Boston, Mass.
Magee Furnace Co., Boston, Mass
March-Brownback Stove Co., Pottstown, Pa.
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Phillips & Clark Stove Co., Geneva, N. Y.
Rathbone, Sard & Co., Albany, N. Y.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schill Bros., Crestline, O.
Schuylkill Valley Stove Co., Spring City, Pa.
Sheppard, Isaac A. & Co., Phila., Pa.
Somerset Stove Foundry Co, Somerset, Mass.
Syracuse Stove Works, Syracuse, N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Union Stove Works, 70 Beekman St., N. Y.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Reineke, Wilson & Co, Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

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Miller, Edward Co., Meriden, Conn
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Union Stove Works, 70 Beekman St., N. Y.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., New York.
Rochester Stamping Wks., Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Tea Pots.
Rochestor Stamping Works, Rochester, N. Y.
Rome Mfg. Co Rome, N. Y.

Tinners' Tools, Machines and Supplies.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bishop, G. E., Dowagiac, Mich.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Chambers St., New York.
Rhodes, Dickelman & Co., Forest, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tin Plate. (*Mfrs. of.*)
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Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphi Pa.

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Keen & Hagerty, Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

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Globe Ventilator Co., Troy, N. Y.
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Marston, I. G. & Co., Boston, Mass.

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Kenney Sanitary Mfg. Co., 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.
Smith & Anthony Co., Boston, Mass.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

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THE METAL WORKER.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A first-class, intelligent CUTTER for large shop in Boston; only one fully capable, and who thoroughly understands drawings, and can get out work from same, need apply. "Manufacturer," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

HEATING MAN, with knowledge of hot water, steam and fan heating; must make plans, specifications, and call on architects. "Expert," office of *The Metal Worker*, 512 Commercial Building, St. Louis, Mo. Oct. 23

A couple of good TINSMITHS on galvanized sheet iron work; state age, if married, and wages expected. "Galvanized," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

To correspond with SALESMAN visiting hardware trade who can handle a line of furnaces; splendid opportunity for right man. "Hardware Trade," office of *The Metal Worker*, 232-288 William street, New York City. Oct. 23

A good all around TINSMITH; one accustomed to roofing, spouting, plain piping and pump work; none but sober and reliable men need apply. Chas. E. Bunce, Riverhead, N. Y. Oct. 16

A first-class experienced CORNICE CUTTER; none need apply who have not filled a like position; must give first-class references. John Seton, 78-80 Washington avenue, Brooklyn, N. Y. Oct. 16

To correspond with SALESMEN visiting the hardware trade in Eastern cities, who can handle a line of furnaces and registers to advantage. "Eastern," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

A man to travel in New England, representing a boiler and furnace manufacturer; must be an expert heating man, and one of good character. "Boiler," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

A good TINSMITH and JOBBER to come and locate in a live New England town. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

SITUATIONS WANTED.

By a first-class STOVE PATTERN MAKER and DESIGNER; thoroughly understands the business in all the details; can do carving and mechanical drafting; an artistic and fast worker; will accept a position on trial for moderate wages. "Designer," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

By expert plater, polisher and buffer; understands brass foundry, brass finishing and pattern making; as FOREMAN of medium sized shop, or to take charge of plating and polishing department in large establishment; 22 years' experience; speaks German and English; can handle help to advantage; unquestionable references. F. A. Weber, 211 West Third street, Cincinnati, Ohio. Oct. 23

A No. 1 PLUMBER with New York license wishes responsible, permanent position. "Plumber," 401 East Eighty-sixth street, New York City. Oct. 23

By a practical foundryman as SUPERINTENDENT of a foundry; am thoroughly familiar with the manufacture of stoves and ranges and steam and hot water boilers; having 11 years' experience; understand modern cupola practice and can handle help; willing to take moderate salary until ability is proven; can furnish best of references. "Superintendent," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

By a first-class TINSMITH and FURNACE MAKER; is also familiar with cornice work and the tinware business; good reference furnished. "Tinsmith," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Oct. 23

PLUMBER understanding sanitary work thoroughly, also low pressure steam and water fitting, wishes to obtain steady position; married; temperate; good reference; country preferred; state wages. "B. W. J.," Red Bank, N. J. Oct. 23

By a young man in hardware store; does not known it all, but willing to work at anything to learn; two years' experience. Any one desiring first-class reference is invited to correspond with Lock Box 154, Bloomington, Ind. Oct. 23

Young man, 17, would like to learn the plumber's trade; can give good reference, both city and country. P. O. Box 66, Center Moriches, L. I. Oct. 23

By a good boy 15 years of age in a tinsmith shop; had experience at roofing, furnace and cornice work; can lay out work from plans; $6 to $7 per week desired; willing to work. John Geo. Werner, care Mrs. Messemer, 636 East 150th street, New York City. Oct. 23

By young man, 18, as first-class plumber's helper; three years' experience; would like steady position; city or country. M. Seaman, 69 Rivington street, New York City. Oct. 23

CORNICE and SKYLIGHT MAKER; first-class assistant cutter; 30 years of age. "K. L. M.," 79 Green street, Newark, N. J. Oct. 23

By a PLUMBER; can do all kinds of plumbing jobbing; am 28 years of age, single and steady; willing to work for reasonable pay. Thos. F. Burke, West Winsted, Conn. Oct. 23

Line of legitimate hardware wanted by TRAVELING MAN of 12 years' experience, with established trade through Iowa, Minnesota and Wisconsin; A No 1 refereuces. "K. 100," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

Steady position by a steady, sober TINSMITH and SHEET IRON WORKER; experienced at inside and outside work; tin roofing, iron pipe, pump work and general jobbing; wages moderate; references. "Tinsmith," care A. Oliver & Co., 173 East Ferry street, Buffalo, N. Y. Oct. 23

As FOREMAN or CUTTER in cornice shop by a first-class draftsman and cutter; can estimate on all kinds of work and handle men to good advantage. Adolf D. Klein, 247 East Seventy-seventh street, New York City. Oct. 23

By a first-class ENAMELER; all colors on cast iron, sheet steel and sheet iron; one, two and three coats. I. Engel, 323 Melrose street, Brooklyn, N. Y. Oct. 16

By a TINSMITH, for inside and outside work; 20 years' expeiernce; ten years in this country; also do jobbing. M. Huppert, 633 East Twelfth street, New York City. Oct. 16

By young man as TIN and SHEET IRON WORKER and GENERAL JOBBER; understands all kinds of inside and outside work; good roofer; permanent job desired; country town preferred; 12 years' experience. "F. J. G.," 45 Marvin street, Saratoga Springs, N. Y. Oct. 16

By an experienced METAL PATTERN MAKER on locks, builders' hardware, iron toys and novelties; familiar with up to date shop practice; a man of ideas and competent to take charge; at present employed, but desires to make a change. "Pattern Maker," 92 Laurel street, Bridgeport, Conn. Oct. 16

As TRAVELING SALESMAN with tin plate, corrugated iron or metal ceiling manufacturer; South or West preferred. "Z. No. 1016," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

A practical FURNACE MAN, who for the past five years has been employed respectively as foreman and salesman with large concerns in a large city, would like to make a change; understands machinery and the making of furnace fittings, &c., by machinery; 25 years's experience; references; can estimate and locate. "Foreman or Salesman," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

By a young man to do soldering on tinware in factory or shop; factory preferred. "F. J. L.," P. O. Box 16, Hawley, Pa. Oct. 16

By a first-class TIN and SHEET IRON WORKER for inside and outside work; over 20 years' experience. F. Hinrichs, 214 Sheldon street, Hartford, Conn. Oct. 16

A bright, well educated young man (22), excellent mercantile training, principally experienced in hardware and heating business, figuring, estimating from plans, &c., also competent D. E. bookkeeper, A1 penman, correspondent and salesman; wants position in any business where exceptional ability, energy, perseverance and adaptability will merit advancement; will go anywhere. "Advance," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

PLUMBER'S HELPER; young man 21, can do wiping, desires more experience; not afraid of work. P. O. Box 222, Florida, N. Y. Oct. 16

By young man as TINNER or CLERK; capable of taking charge; first-class references; strictly temperate and character above reproach. Kerr, 257 West 114th street, New York City. Oct. 16

As CORNICE CUTTER; can furnish 8 foot brake. John Aldridge, 242 Grove street, Jersey City, N. J. Oct. 16

By STOVE DESIGNER and CARVER after October 15; up to date on design; references. "A.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Oct. 16

As FOREMAN of pattern shop in stove foundry; experienced on stove construction; reference given. "H.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Oct. 16

By practical heating engineer as SALESMAN, ENGINEER or FOREMAN; temporary or permanent; steam, hot water, furnace or fan blast systems; also steam cooking and hotel work; thoroughly competent in every detail; acquainted with architects, chefs and the trade in this vicinity, and can influence business; moderate salary; good references. "Industry," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

Inside or to travel, by a SALESMAN of 16 years' experience in stoves and plumbers' supplies; have traveled through Connecticut and Massachusetts for 10 years and am thoroughly acquainted with the trade. Address "G. W. S.," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 16

By a PLUMBER, STEAM and HOT WATER FITTER; eight years' experience. A. Miller, 113 North College street, Schenectady, N. Y. Oct. 9

By a good all around TINSMITH; can do inside and outside work; also steam and gas fitting; steady and sober; 12 years' experience. W. Pahland, 374 Spring street, West Hoboken, N. J. Oct. 9

By a first-class TIN and SHEET IRON WORKER; well experienced in furnaces and ranges, ventilating and jobbing work; New York City or Brooklyn preferred. "Mechanic," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

GALVANIZER and SOLUTION TINNER; over ten years' experience in all branches; can give instruction in laying of baths. William Whitnum, 363 Leonard street, Brooklyn, N. Y. Oct. 9

By a young man; strictly sober, honest and reliable; would like to finish plumbing and tinning trade; position in a good house where honest efforts will be appreciated and advancement offered; reference first class. Box 6, Dawnsville, N. Y. Oct. 9

By a young man, age 22 years; sober, honest and reliable, with seven years in general hardware, including nearly all branches; would like position with a good retail house where honest efforts will be appreciated and advancement offered; can furnish gilt edge reference. Box 6, Dawnsville, N. Y. Oct. 9

As BOOKKEEPER and SALESMAN in store handling stoves, ranges, furnaces, &c.; six years' experience; figure, estimate or oversee work. "Experienced," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

With some stove, hardware or tin plate firm; either traveling or in the house; 40 years of age, with 23 years' experience in stove and tin business; best of references. Banner M. Allen, Bellefontaine, Ohio. Oct. 9

As FOREMAN or CUTTER in cornice and skylight shop by a first-class draftsman and cutter; can estimate on all kinds of work and handle men to good advantage; can give the best of references. "Cutter," office of *The Metal Worker* 117-119 South Fourth street, Philadelphia, Pa. Oct. 9

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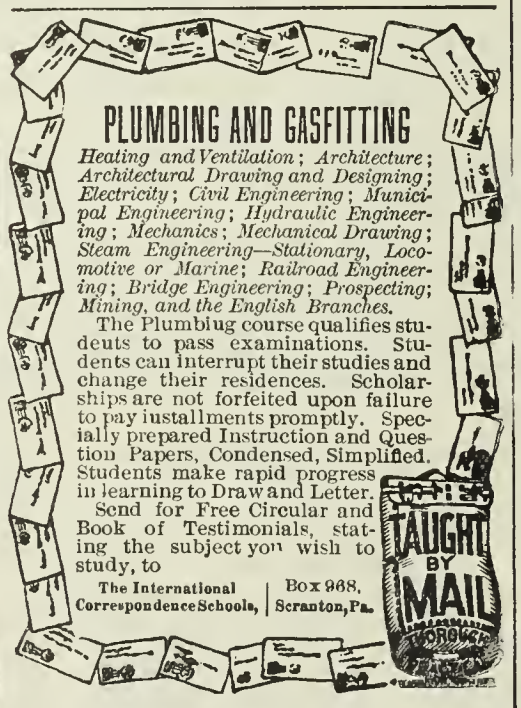
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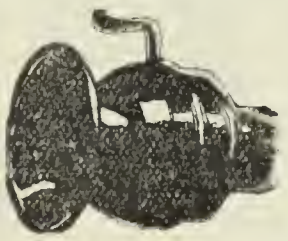

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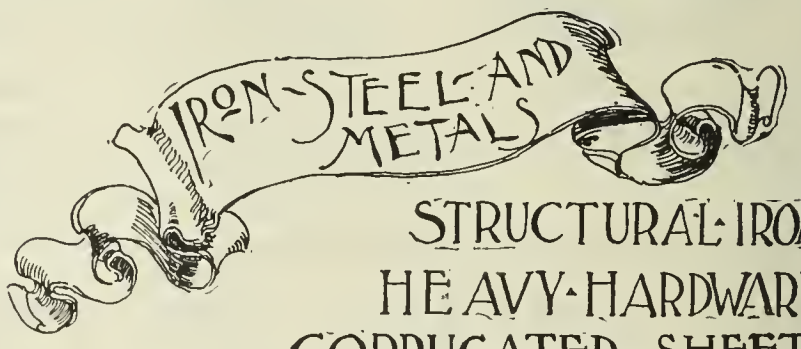

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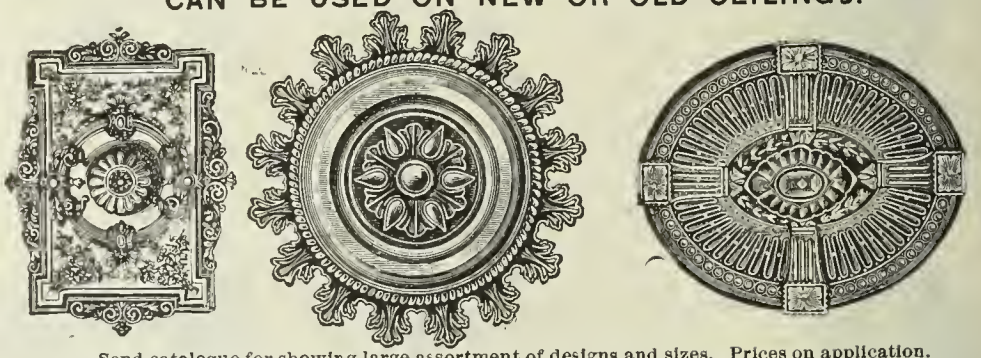

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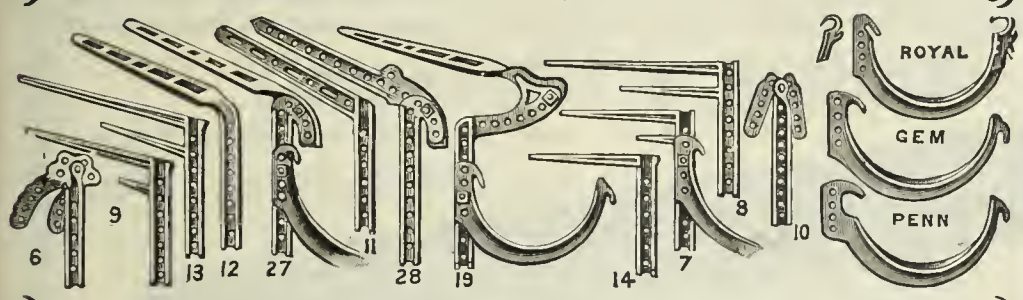

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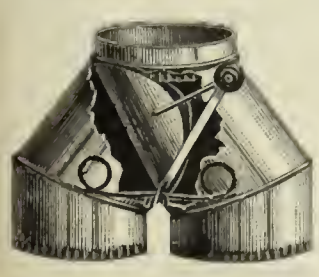

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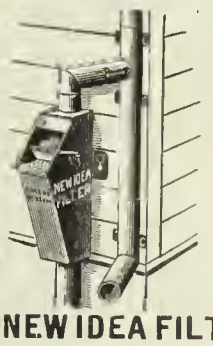

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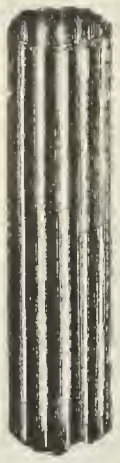

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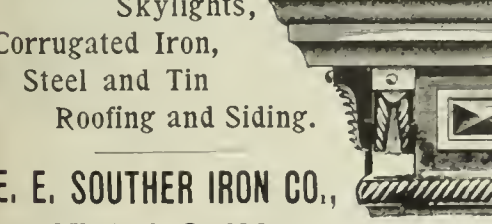

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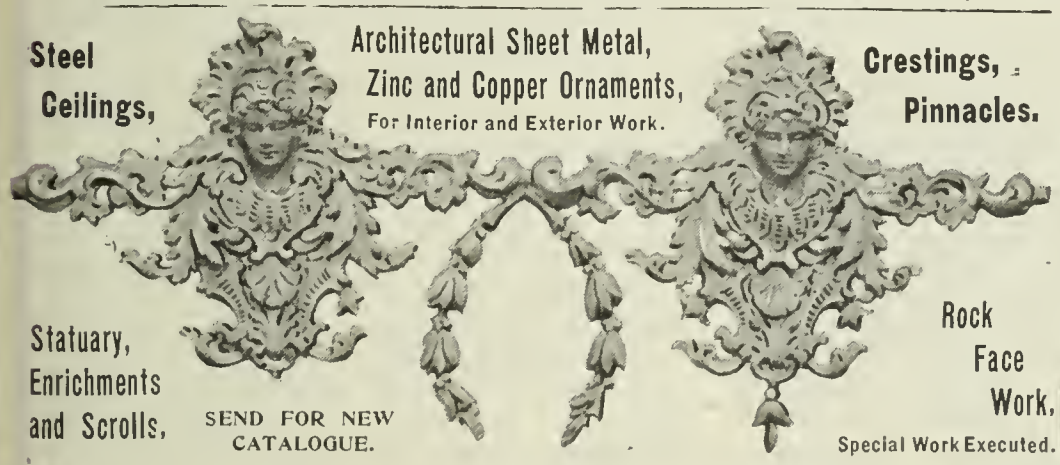

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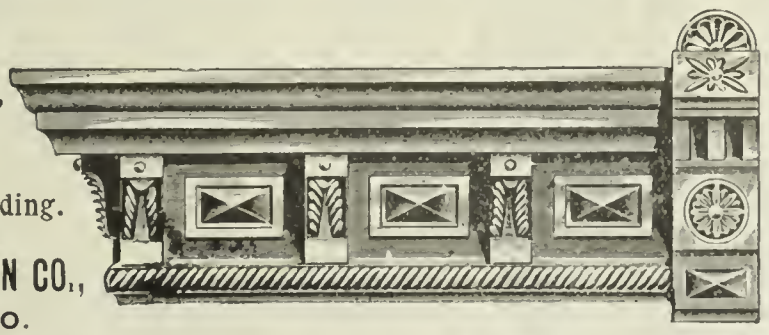

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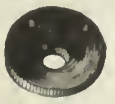

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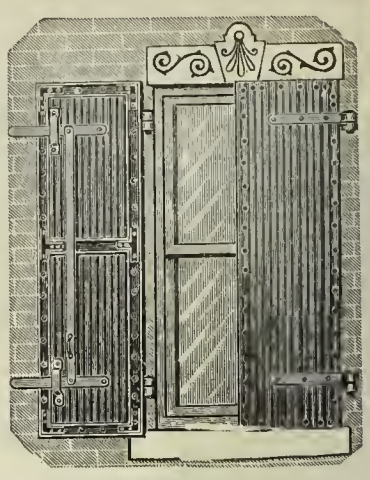

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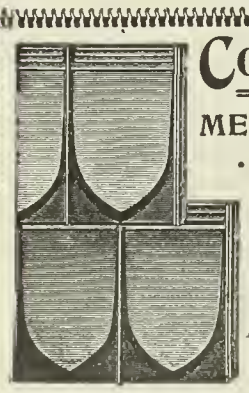

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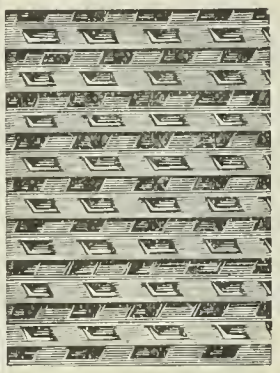

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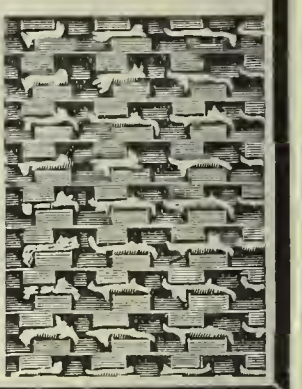

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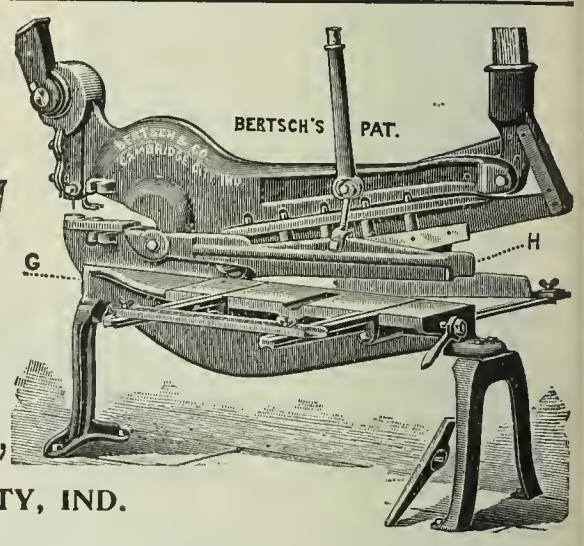

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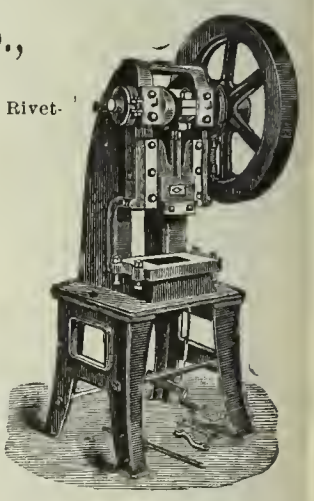

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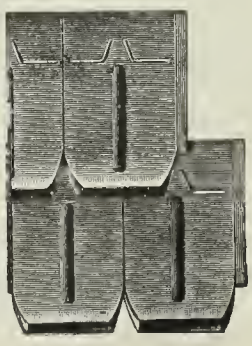

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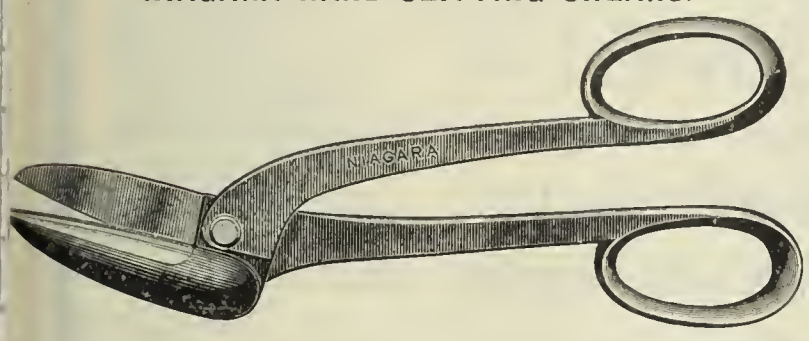

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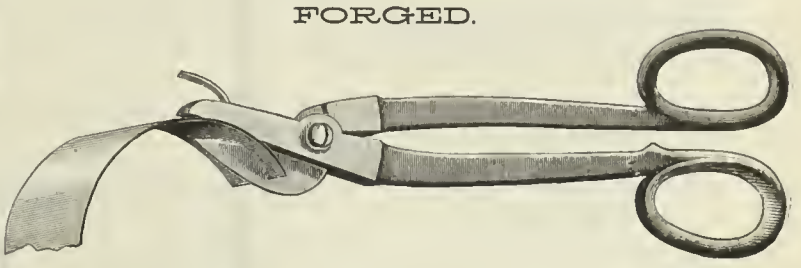

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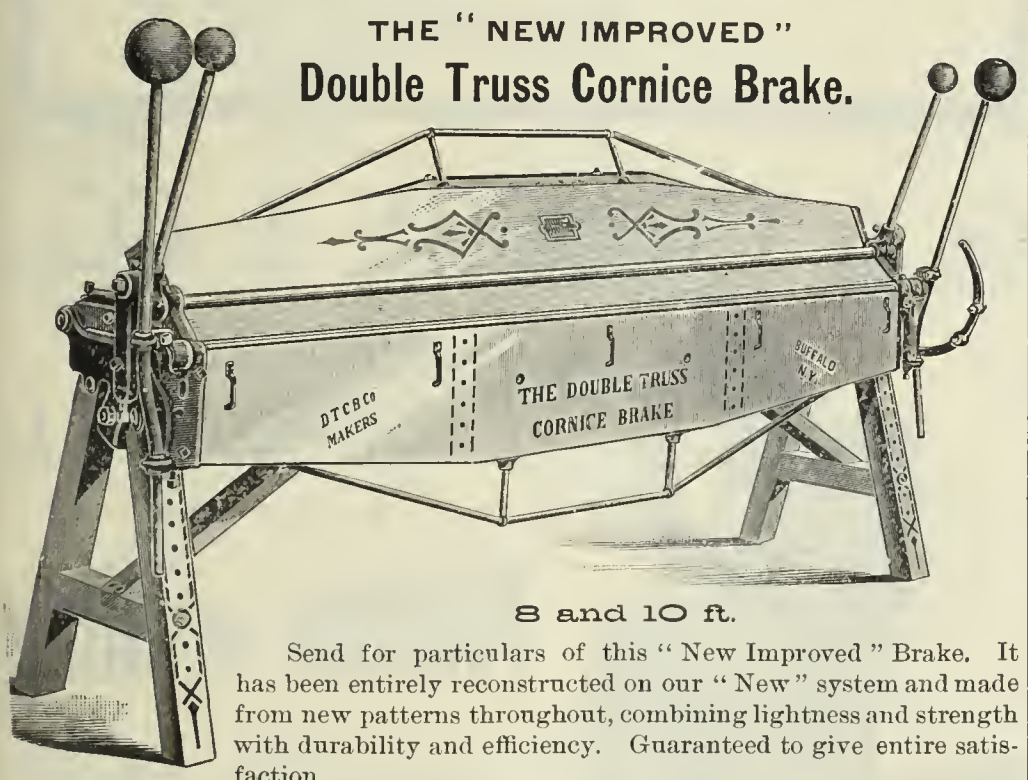

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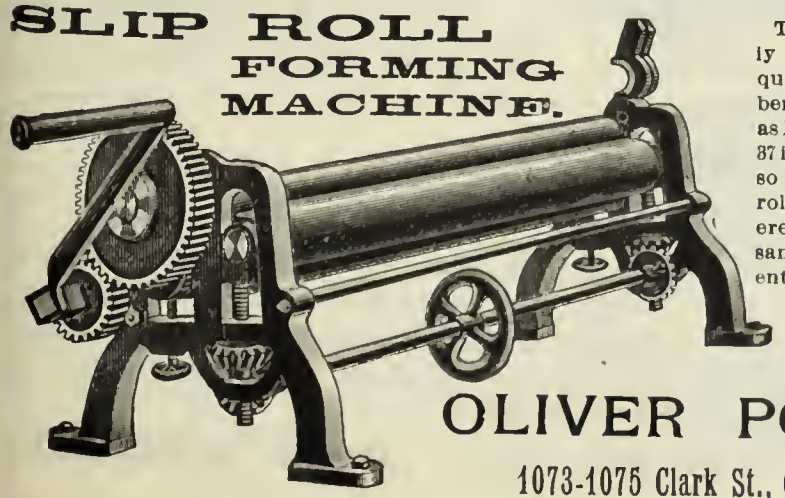

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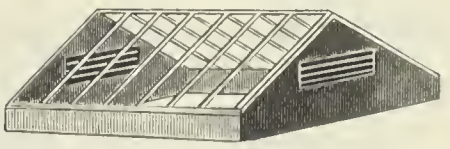

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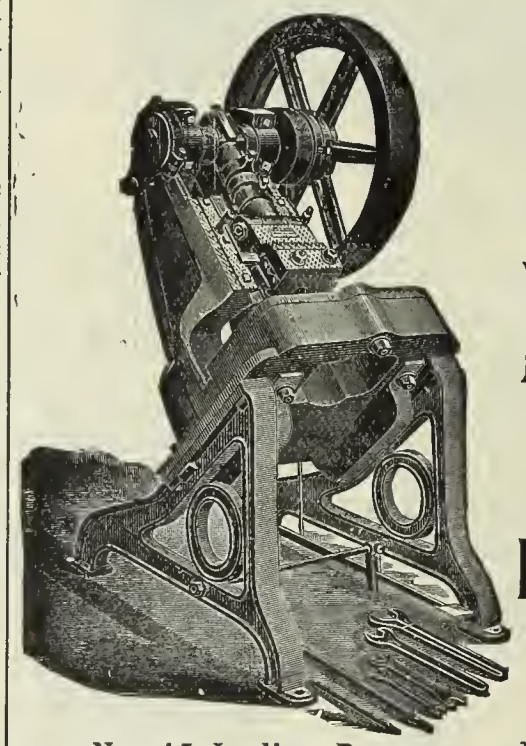

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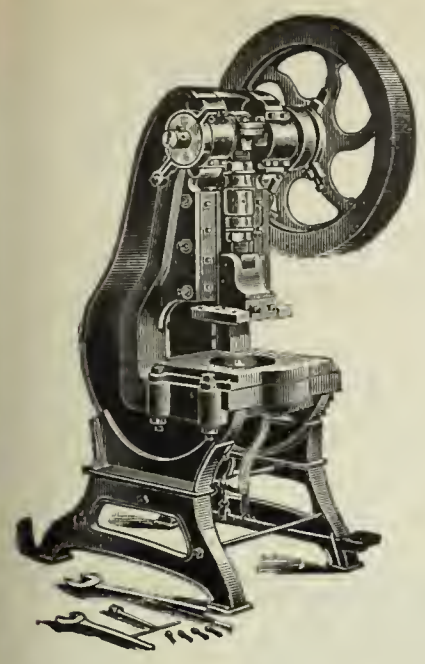

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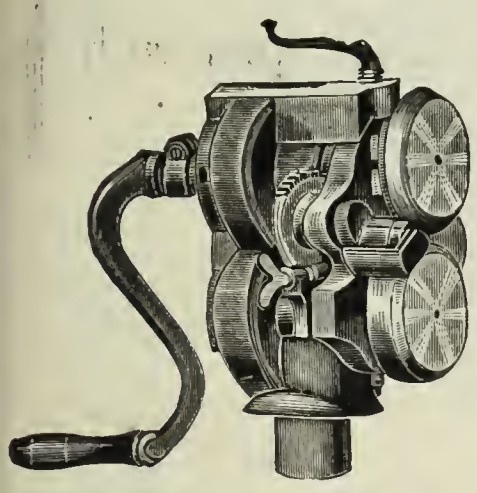

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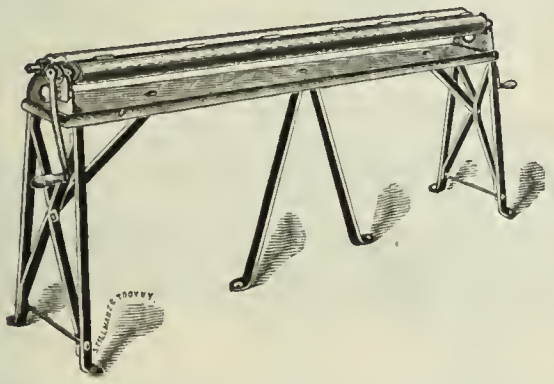

is adapted to form gutter from 3 inches to 7 inches inclusive. The forming of the bead and gutter is practically a continuous operation. Capacity 600 feet perfectly formed gutter per hour with two ordinary men or boys.

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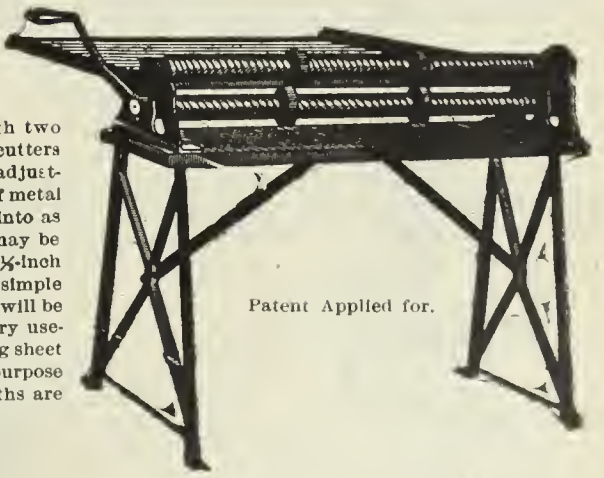
are provided with two or more pair of cutters which are easily adjusted to cut a sheet of metal 30 inches wide into as many strips as may be desired, from ¼-inch and wider; is simple and durable, and will be found to be a very useful tool for slitting sheet metal for any purpose where long lengths are required.



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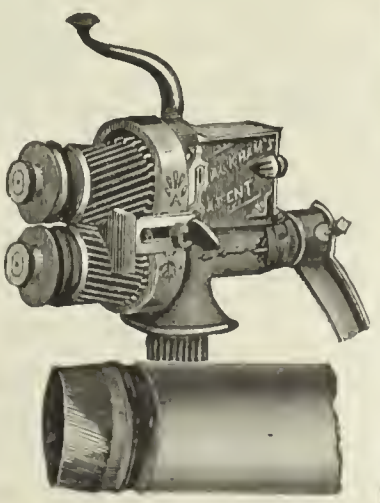

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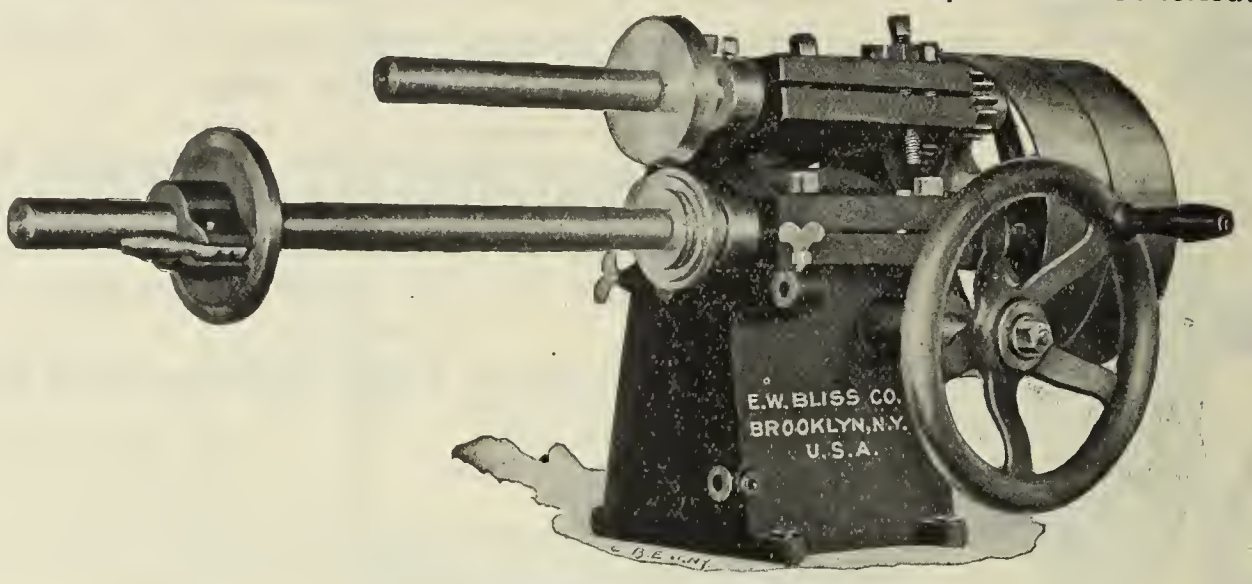
In the ordinary type of Beading and Flanging Machine, the shafts open apart by a hinge at the end. Unless the shafts and rolls are adjusted with the greatest nicety, satisfactory work cannot be secured. This is due to the fact that, when the shafts are thrown apart to put on or remove the work, they are farther apart at the outer point of contact than at the inner. This also makes it impracticable to shift the position of the rolls to suit cans of various lengths, unless they are of the exact diameter required to bring the shafts parallel. If not so made, when the rolls are brought closer together or moved farther apart, the parallelism of the shafts is destroyed and the rolls do not fit.

To overcome this difficulty, we have designed the machine shown in the accompanying illustration. In it the upper shaft bearings have a hinge parallel to the shafts. When the two shafts are separated their parallelism is not disturbed. Thus the outer rolls may be placed at any point on the lower shaft, making the machine available for a wide range of work. The shafts are brought into working position by the hand wheel shown instead of by the usual foot treadle.

Write for Further Particulars. **Correspondence Solicited.**



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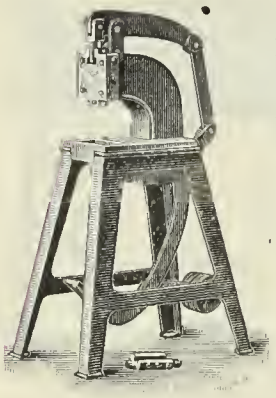

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—SILENCED HIM.—The master was asking questions—masters are apt to ask questions, and sometimes, too, the answers are apt. This question was as follows:

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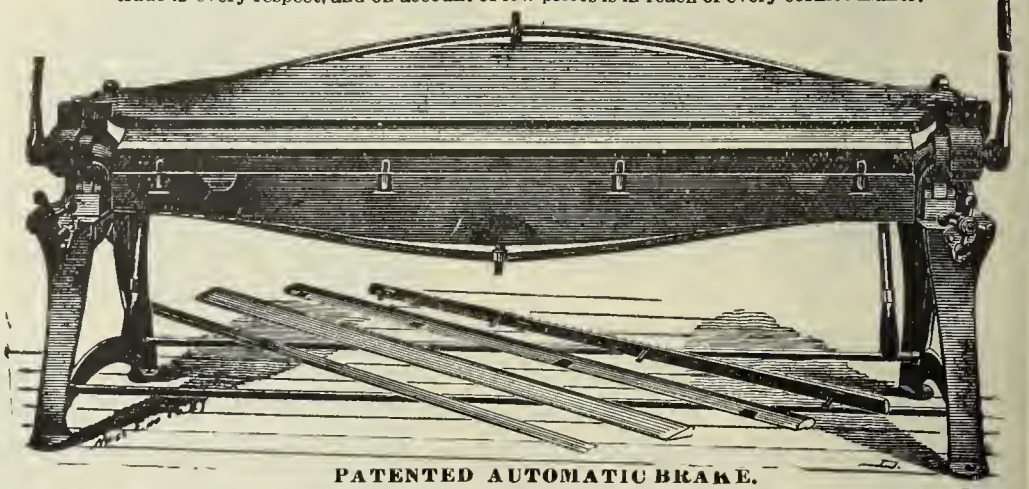

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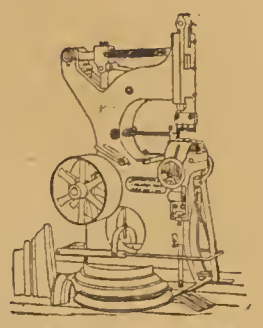

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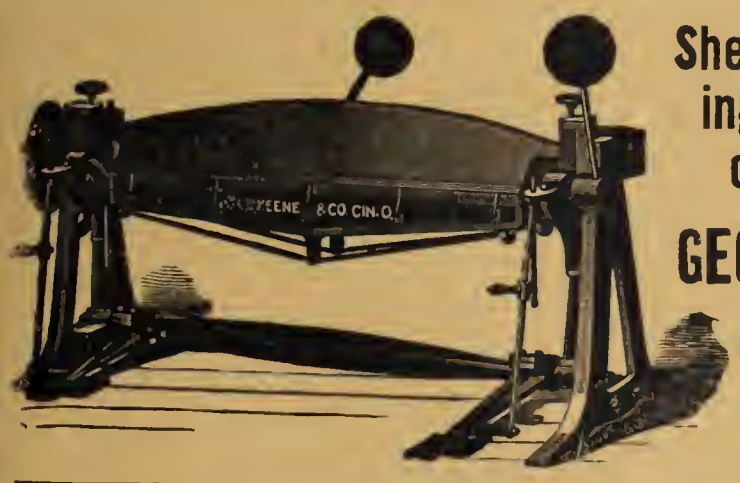

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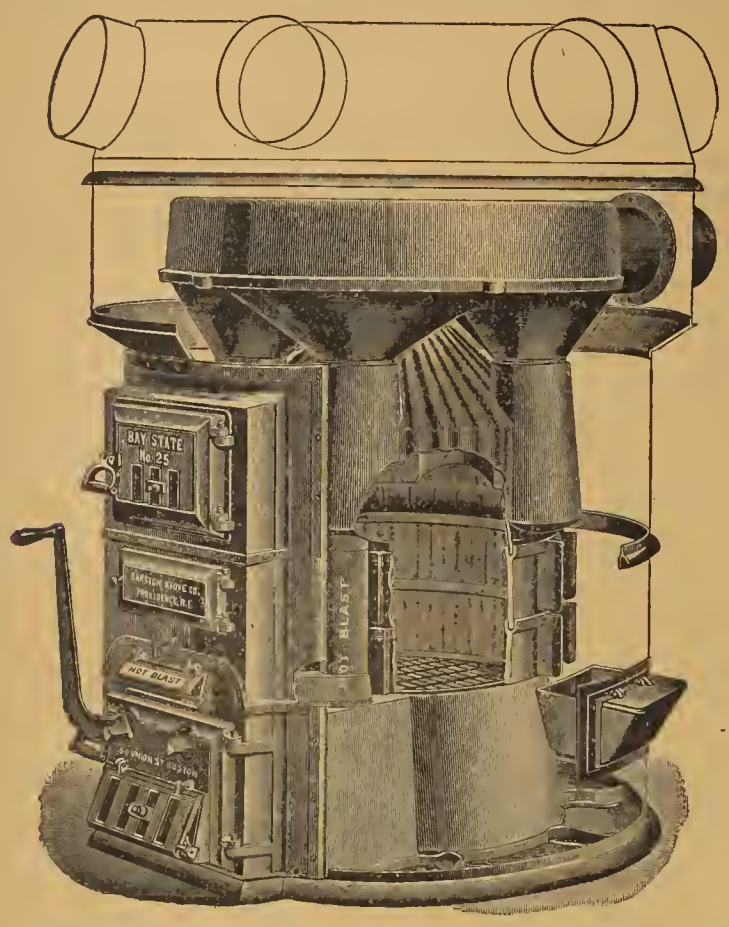

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Index to Advertisements, Pages 75 - 77

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

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VOL. XLVIII. NUMBER 18.

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SEE THE MAGEE Advertisement PAGE 24.

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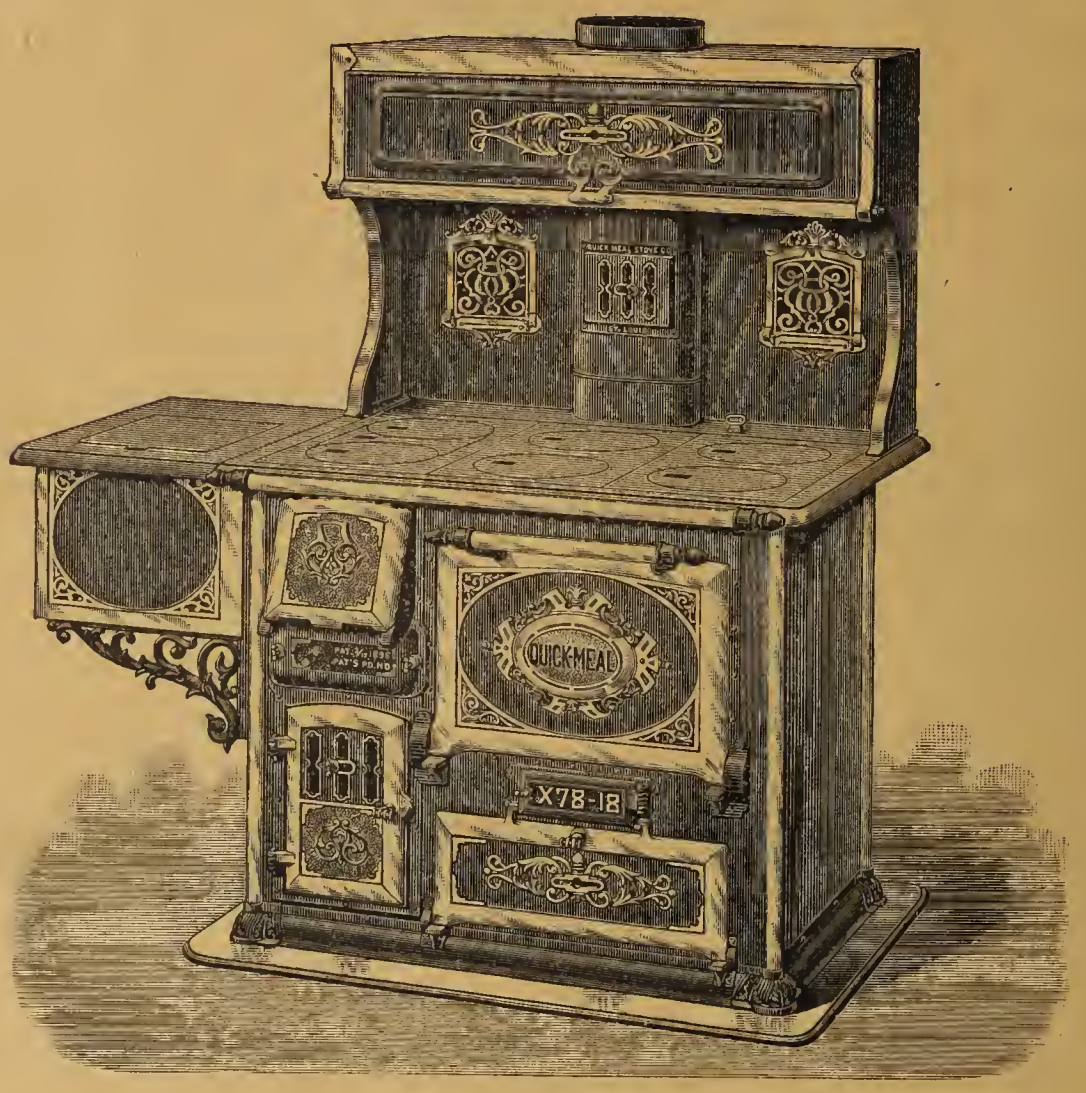
STEEL RANGE.



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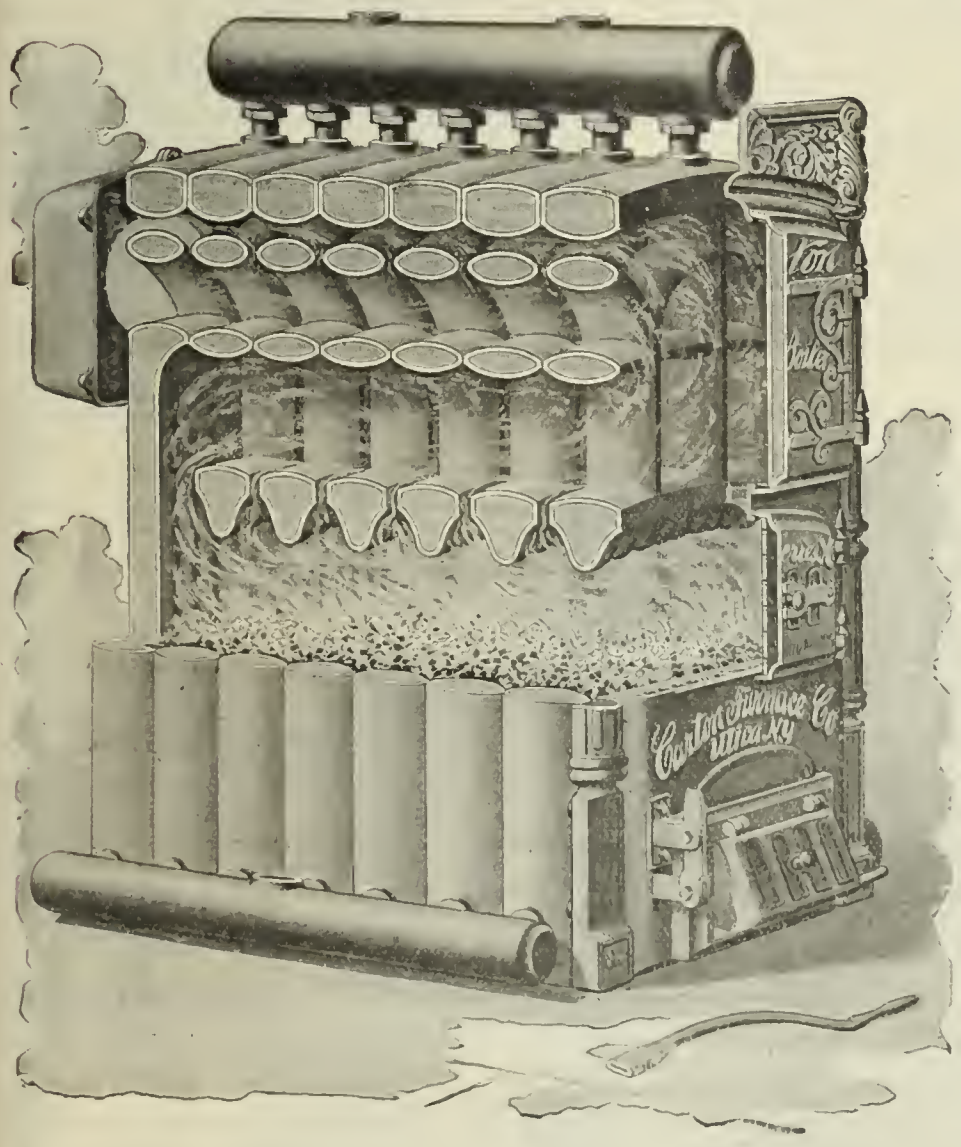

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and we will take the subject up with you.

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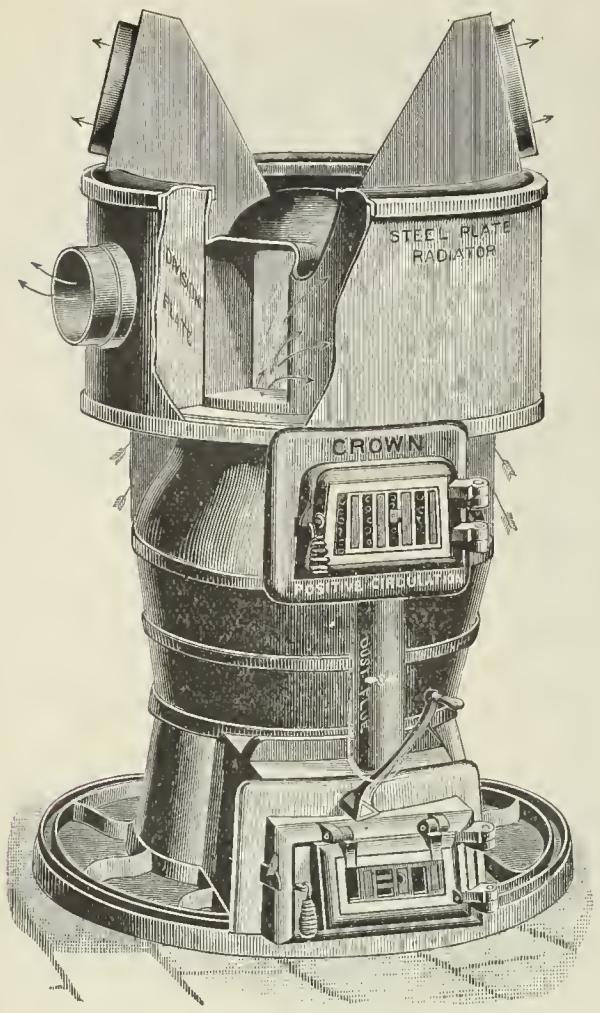

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For Long Distance Heating by means of AUXILIARY FLUES.

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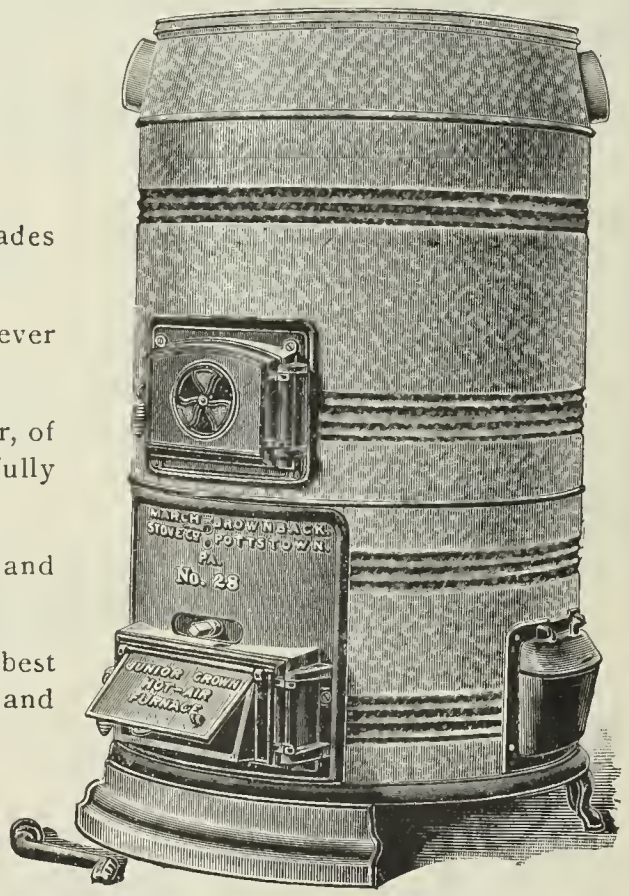

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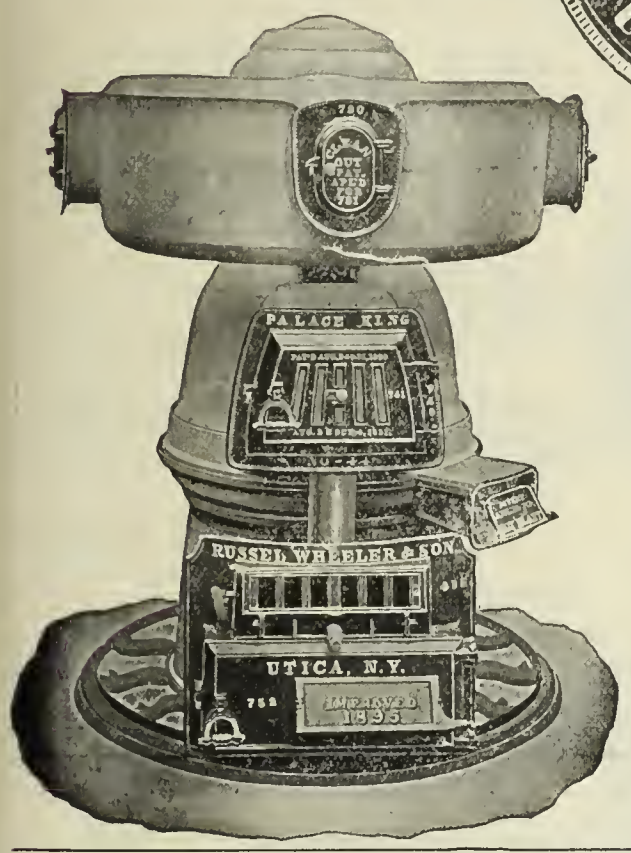

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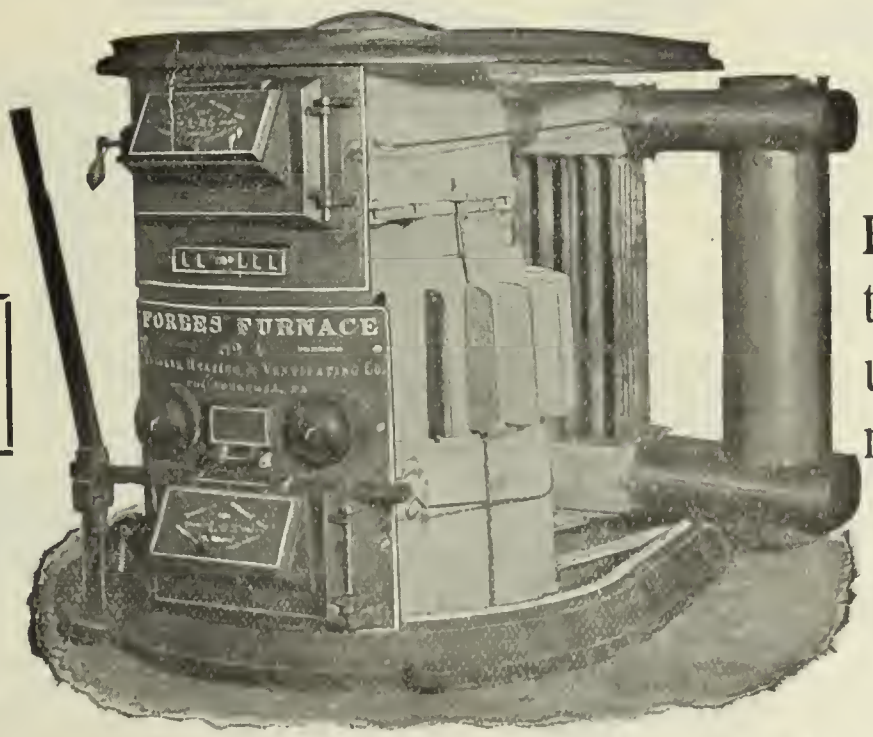
I think your furnace is all you claim for it, and do not hesitate to recommend it to any one desiring comfort and economy. Very truly,

5027 Florence Avenue. M. J. FALLS.



SEND FOR CATALOGUE

COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

TUBULAR HEATING AND VENTILATING CO.,

228 QUARRY STREET, PHILADELPHIA.

Here's A New Line

IT WILL PAY YOU TO LOOK INTO.

8 STYLES, 32 SIZES.

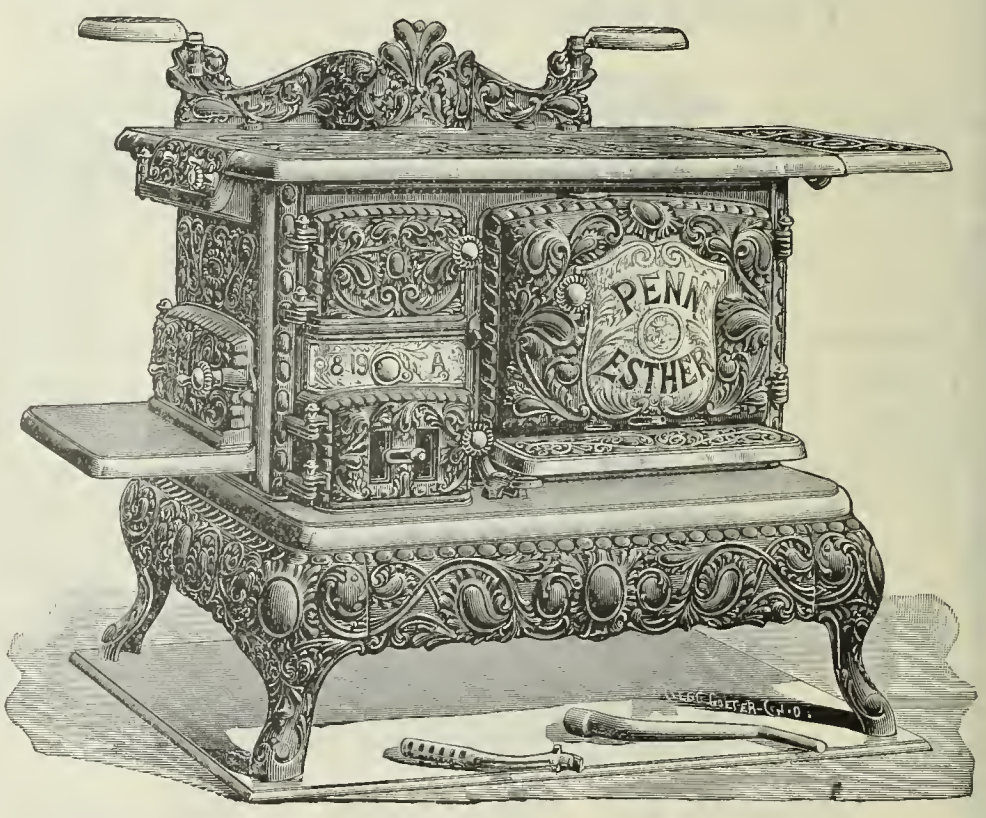
Latest and most modern ideas in range construction.

Right and left hand ovens.

Surplus heat from oven utilized to heat an upper room without expensive fittings.

PROGRESSIVE GOODS FOR PROGRESSIVE DEALERS.

We want to tell you all about this line, its prominent features, its great superiority and ***its low prices.*** A postal request from you will bring you a little book which will do our talking.



THE MT. PENN STOVE WKS., Reading, Pa.

PHILADELPHIA STORE, 111-113 N. 2nd STREET.

The Only Round Oak!

Superior to any Heating Stove in the World!

And it has no—"Ash Pan."

For 20 years the eminent Stove Makers have endeavored to account for its phenomenal success—without an—"ASH PAN."

For 20 years they have fought it—"tooth and nail"—"fair and foul"—"it could not succeed," "it had no ash pan."

It is succeeding fairly well—thank you—its sales are nearly—one-third—the entire output of—Oaks—and growing.

It still leads the way—without an "ash pan" and provides—fame—and a—name—for—counterfeits—to trade upon—safely inside the law.

***GREAT* is the only—Round Oak!**

Originated and made famous by

Beckwith,
Dowagiac.

In all manuf

Price always reg

The larger the output, the better the more economy.

The Michigan Stove Company are th world, and they can therefore better afford t than any other manufacturer.

We at all times guarantee our stoves a grades can be had for elsewhere, and our con advance of any others in pattern, convenienc

"Garlands" are all that could be asked for where first-gra lower-priced grade "Michigans" meet the demand admirably, be

The best is alway

With our two i everything that could sideration will surely chant of the truth of th

The Michigan

Largest Makers in th

DETROIT, CH

tured articles

lates the quality.

ilities for manufacturing, and therefore the

largest makers of stoves and ranges in the
offer their patrons good value in their wares

ranges to be no higher in price than equal
nt aim is to produce goods which are far in
nd durability.

toves and ranges are desired, and where the demand is for a
he peers of any stoves and ranges made, outside of "Garlands."
apest in the end, but some purses demand lower-priced goods.

parable lines we offer
sired, and a little con-
nce the thinking mer-

ove Company,

es and Ranges
ld,

BUFFALO.

Peerless Andes.

Entirely New. *Finest Range Ever Made.*

WE present the latest addition to the ANDES line of Stoves and Ranges. As will be noticed from the above cut, the design is bold, up to date, and strictly correct, artistically considered. This range is unusually large in every way. It has every improvement which is at all desirable. The oven is very large and well ventilated; heated on five sides The ash pan is unusually large. The fire box is a new and improved form, perfect in its fittings. The grate is of our own improved style of draw out form, together with our own patent arrangement for taking out the single bars without removing the fire box. The entire grate can be drawn out without removing the fire box. The wood fixtures for this range we claim to be better than any heretofore made. The reservoir is unusually large. The oven door, as is shown in the above cut, has the best form of oven thermometer made. The top oven plate is cemented. The bottom of the stove is double. The back of the oven is double. An elegant nickel band on the edge of main top, and also on the edge of high shelf. Reed's patent check damper. Towel rod. Elegant plate panels. In every respect this range is as good in design, form, weight, quality of castings and mounting as can possibly be made. The prices will be right.

Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

The Radiant Andes.

Entirely New. Medium Price.

ELEGANT Plated Trimmings, Handsome, Attractive, Large Sizes, Large Pan, Heavy Pots, Heavy Stoves, Well Made, Durable Stove, Good Hot Air Flue. Every Stove a Double Heater, Duplex or Draw Centre Grate.

Two sizes, No. 13, 13-inch Fire Pot.
" 15, 15 " " "

An important addition to the Andes Line, a handsome, attractive. well made stove, very heavy pots, durable in all parts; it is made to suit the times. Prices are right and will interest the buyer.

Oak Andes.

EVERY manufacturer claims he has the *BEST OAK STOVE.* Every buyer wants the *BEST OAK STOVE,* and without the least fear of contradiction we offer to the trade the

OAK ANDES as the best BEST OAK STOVE.

It has the *BEST AIR TIGHT JOINTLESS BOTTOM,* the *BEST AIR TIGHT REGISTER DAMPER,* the *HEAVIEST FIRE POT,* the *HANDSOMEST DESIGN* and the *BEST WORKMANSHIP* of any stove on the market.

It is beyond question an *AIR TIGHT STOVE.*

The sales for 1896 were four times as large as the manufacturers expected and the indications are now that the capacity of the works will be severely taxed to meet the demand for the present year. Buyers who wish the best should secure agency at once.

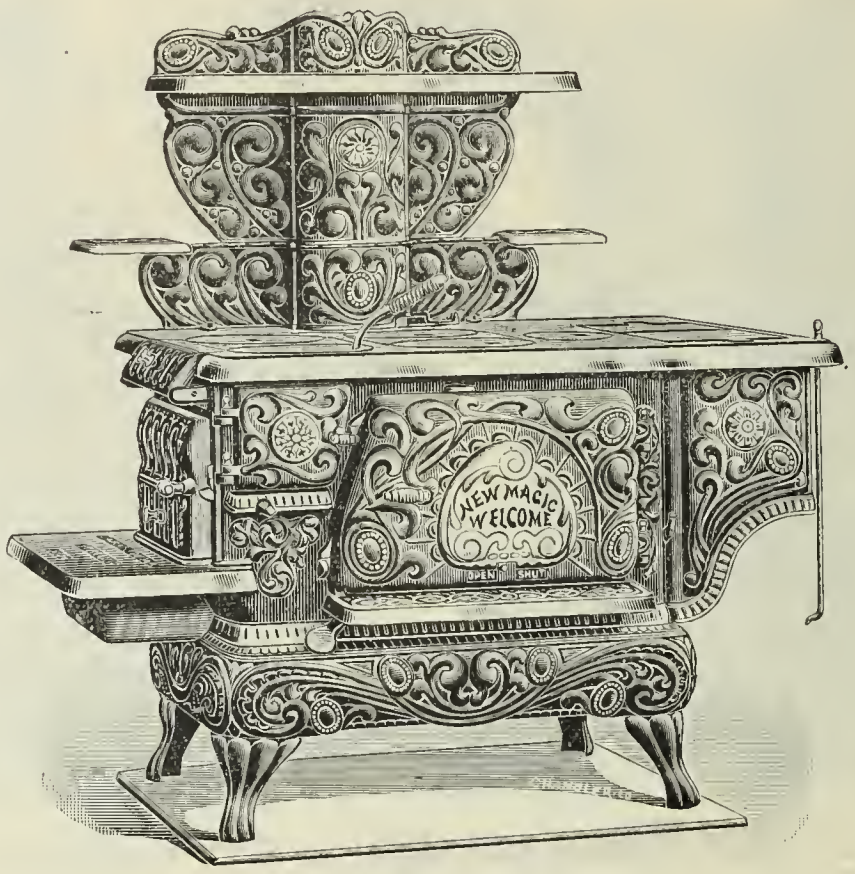
Phillips & Clark Stove Co.,

Geneva, New York.

EASTERN BRANCH:
139 River Street, Troy, N. Y.

WESTERN BRANCH:
135 Lake Street, Chicago, Ill.

WELCOME STOVES AND RANGES.



NEW MAGIC WELCOME RANGE.

When we presented to the trade five years ago our Magic Welcome Range we predicted it would create a sensation. Note the result. We have sold more than ten thousand Magic Welcome Ranges and the demand increases. Our New Magic Welcome Range will prove a worthy member of our growing family. Will the progressive dealer who has not secured the sale of a Bread-winner, write us for terms and prices? Address

Syracuse Stove Works,

SYRACUSE, N. Y.

Western Agents,
A. J. LINDEMANN & HOVERSON CO.
MILWAUKEE, WIS.

New York Office,
105 BEEKMAN STREET.

SPECIAL RETORT OAK,

Entirely New in Principle and Construction.

AT LAST SOMETHING NEW IS OFFERED THE STOVE TRADE.

HANDSOME, DURABLE and LOW PRICED.

We guarantee *THE SPECIAL* to be the best Stove for Hard Coal ever built.

We KNOW it is the best SOFT COAL STOVE in the world.

As a COKE BURNER it is PERFECTION ITSELF.

This CONSTRUCTION has been recently patented, and will be controlled by us for the next 17 years.

We know the trade is supplied with stoves for this year, but it will be wise to investigate the merits of *THE SPECIAL RETORT OAK* by ordering samples and testing the stove before making arrangements for next season's business.

Please write us for booklet containing record of tests of various Coals and Coke to determine their relative values as fuels, and also description of *THE SPECIAL RETORT OAK*, the Stove in which these tests were made.

4 SIZES, Nos. 14, 16, 18 and 22.

ADDRESS

MARION STOVE CO., - - Marion, Indiana.

Say what paper you saw this in.

Why

Are the *ACORN STOVES AND RANGES* sold more generally than any others ?

Why is it that our enormous foundries are being pushed to the utmost capacity to supply *ACORNS* ?

This question practically answers itself. Stove Merchants realize that in the ACORN Line they can get the specialties they need *to suit their peculiar wants,* and a variety large enough to suit the whims of their customers. Then, too, these specialties cost from $2.00 to $4 00 less than other stove concerns ask for some=thing not so good as *ACORNS.*

You see in other so=called "lines" some particular stove or range that the makers claim great things for, but you can match *any* of them with an *ACORN,* and beat them, both in selling features and price

If you have not tried it, we can prove it to you.

Rathbone, Sard & Co.

ALBANY. CHICAGO. DETROIT.

Eastern foundries, - Albany, N. Y

Western foundries, - - Aurora, Ills

HIGH, YET LOW.

High in Grade, Low in Price.

IF YOU want a "seller" you need not look beyond this stove---you need only show it and name the price to get the order. If you are in business for "profit" send us a postal for a description and the price of this stove; it will be a cent well invested, as you will find.

SCHUYLKILL VALLEY STOVE CO., - SPRING CITY, PA.

Maple Clermonts

have bodies made of 16 gauge polished steel. Large ash pans. Ground doors and screw registers. Strictly air tight Perfect fire keepers. Shaking draw-center wood grates. Large, convenient top feed. Large door feed with smoke guard. HEAVY CAST LINING ALL AROUND, EXTENDING ABOVE FIRE LIMITS. Cast tops and bottoms. Extra he vy polished steel bodies corrugated to prevent buckling. Screw draft registers. Nickel foot rails, name plates and panels. Ornamental swing cover and spun urn. The finest, handsomest and best built stoves on the market.

Front Feed Maple Clermont.
Also has top feed under swing cover.

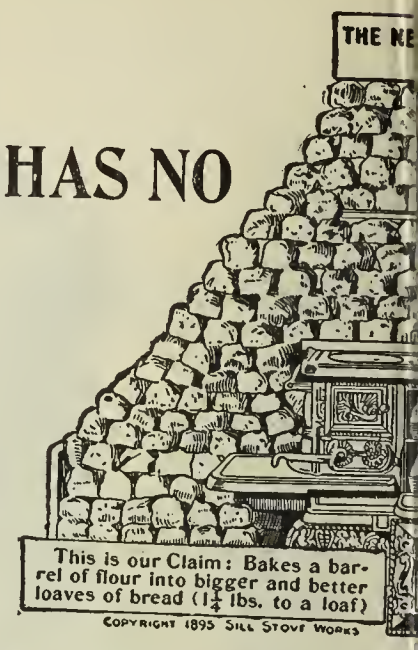
Gem City Stove Co.,

Dayton, Ohio.

Eastern House: 107 North 2d St., Philadelphia, Pa.

STERLING STOVES.

HAS NO


THE NE
This is our Claim: Bakes a barrel of flour into bigger and better loaves of bread (1¼ lbs. to a loaf)
COPYRIGHT 1895 SILL STOVE WORKS

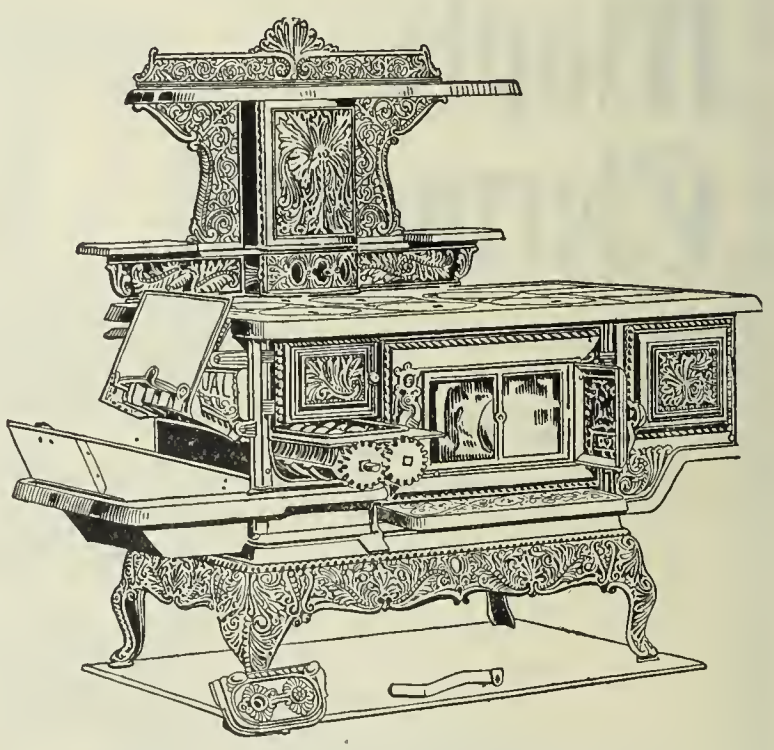
Catalogues and discounts furnished on application.

STER

SPECI

Every Up-to-Date Dealer shoul

SILVER STERLING.

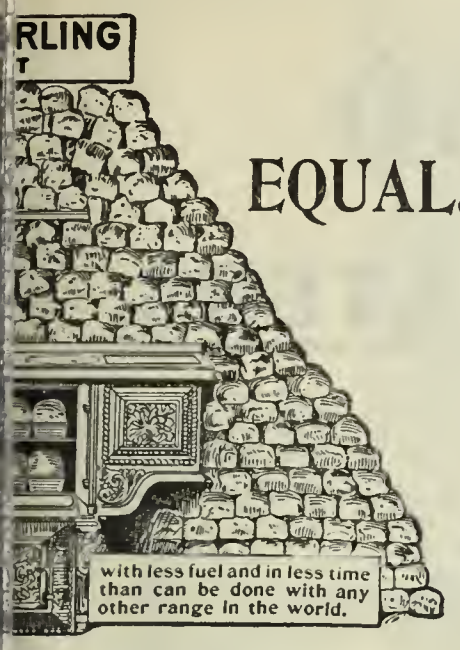


NEW STERLING RANGES.
The great "HAS NO EQUAL" Series.

SILL STO

BOSTON.

ROCH



EQUAL.

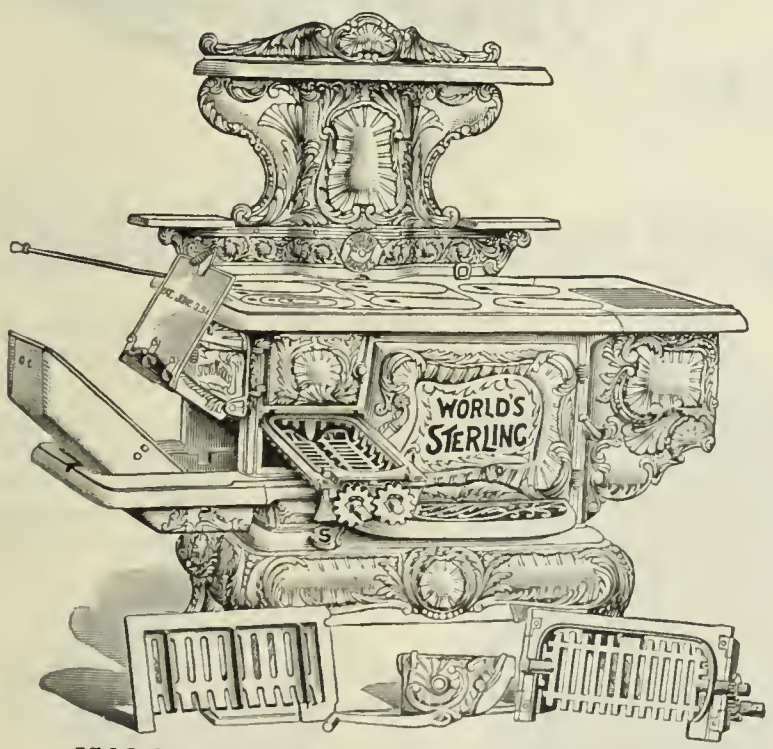
STERLING RANGES.

Write for "Sterling Booklet" giving full description.

,LING

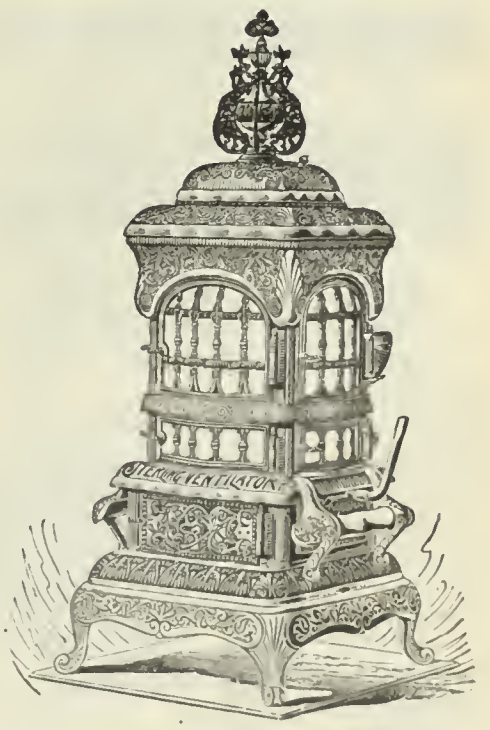
LTIES.

have these Leaders on his floor.



WORLD'S STERLING RANGES.

Three Series:—One 4-Hole, Two 6-Hole.



STERLING VENTILATOR.

E WORKS,

STER. CHICAGO.

Cast Openwork, in two parts, hinged at back, allowing cylinder to be tipped back for removing Fount and Lighting.

Cylinder of Russia Iron with Removable Top and Window Frame Nickel Plated. Base and Cast Openwork in Black Japan or Nickel Finish.

No. 351, Full Nickel Finish.
" 353, Base and Openwork Black Japan Finish

ONE OF 16

Styles of...

MILLER OIL HEATERS.

Don't fail to send for Catalogue No. 57, just out. It contains illustrations of our entire line, many new patterns and new features. They will sell and give perfect satisfaction.

EDWARD MILLER & COMPANY,

STORES: 63 Pearl St., Boston, Mass., and 28-30 West Broadway, New York.
Factories and General Office, Meriden, Conn.

Richmond RANGES

THE DEALER

Wishing to Supply only the Best should Acquaint Himself with

THESE PRODUCTIONS.

ECONOMICAL,
DURABLE AND EFFICIENT.

A REPUTATION OF THIRTY YEARS.

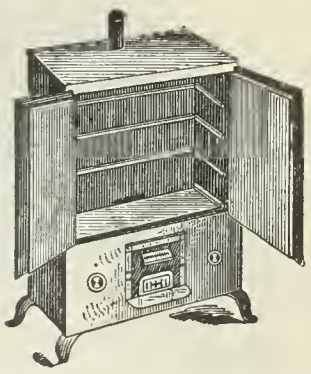
Richmond FURNACES

RICHMOND STOVE CO., NORWICH, CT.

BLODGETT'S PATENT PORTABLE OVEN

FOR

Hotels,
Steamships,
Confectioners,
Public Institutions, &c.
Core Baking,
Bluing,
Hardening Rubber Goods,
Bronzing,
Hardware Specialties, &c.



The only Oven Baking by Perfect Circulation of Hot Air.

Made in ten sizes. Send for Catalogue.

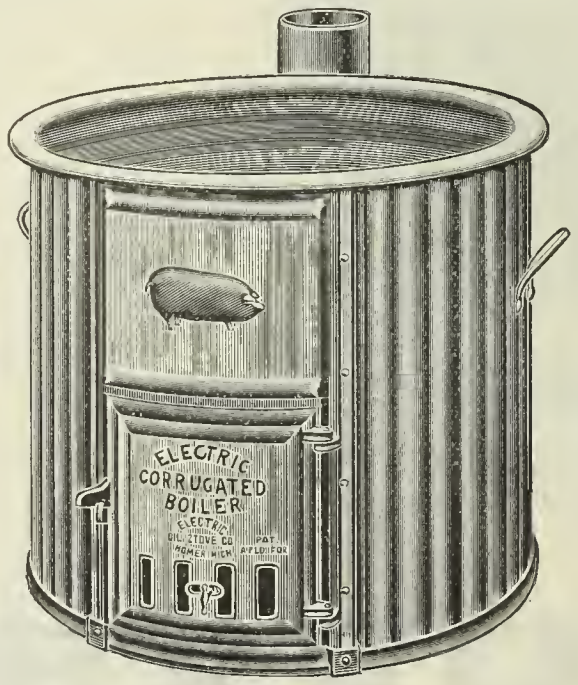
—— ALSO ——

Bicycle Enameling Ovens.

THE G. S. BLODGETT CO., Mfrs.

BURLINGTON, VERMONT.

ELECTRIC CORRUGATED BOILER



PATENTS PENDING.

Is conceded to be the best and most practical Farmers' Boiler ever offered to the trade.

They are mounted on a very heavy **Corrugated Steel Jacket,** which provides for **expansion** and **contraction,** making it the most **durable furnace possible to construct.**

SPECIAL FEATURES:

Full Length Cast Iron Door Frame with Large Door. Malleable Iron Handles. Mechanically Built. Strong, Durable. Practical. Cheap.

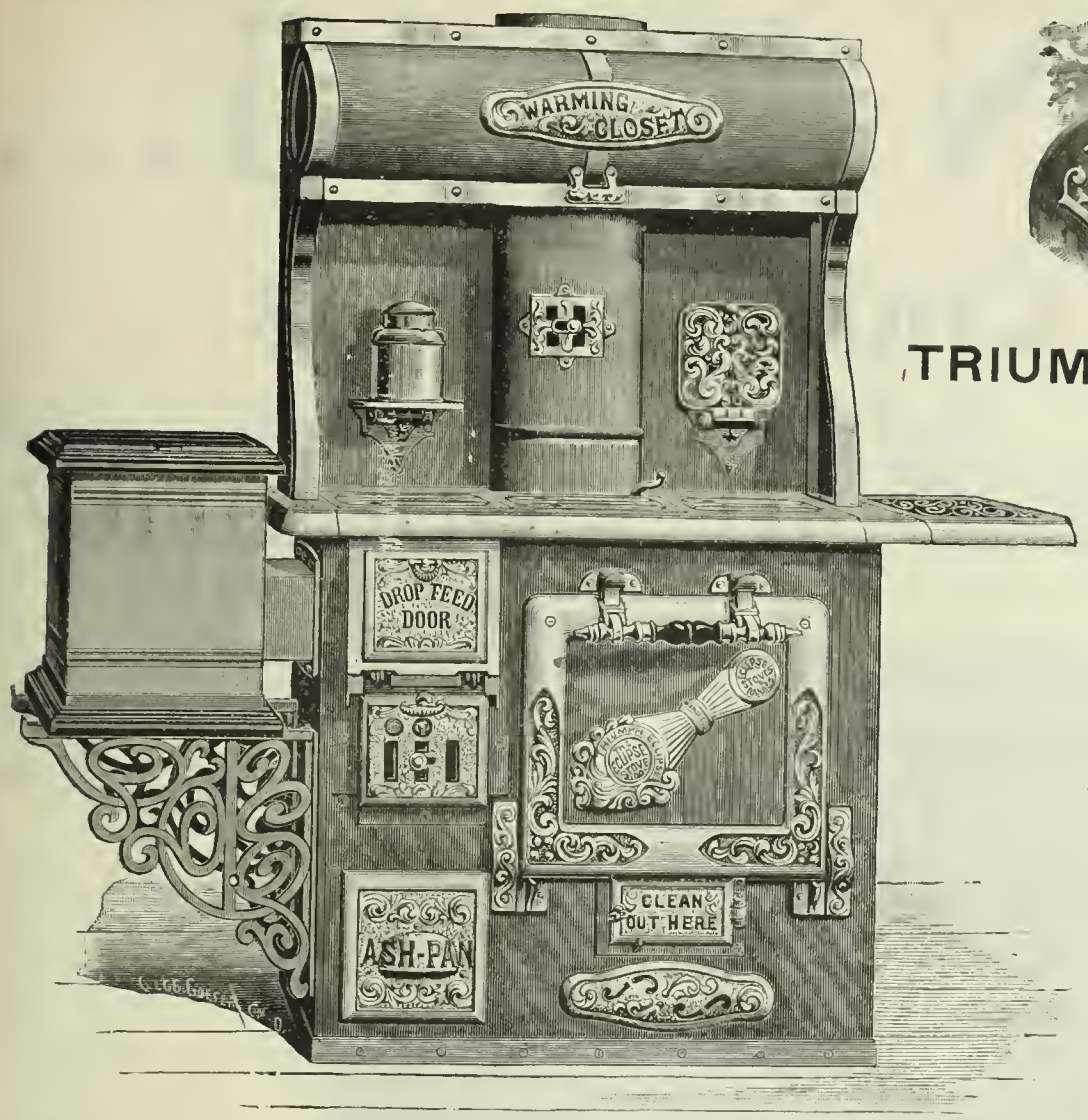
Made in Three Sizes, 40, 60 and 70 Gallons.

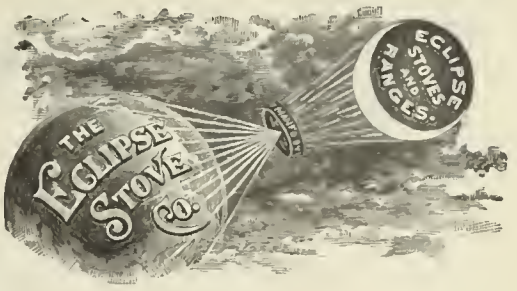
It will pay you to get our prices before placing your order.

MANUFACTURED BY

ELECTRIC OIL STOVE COMPANY,

Homer, Michigan.





TRIUMPH B SERIES

The cheaper style of our

Triumph Eclipse Steel Range

EQUAL TO THE BEST

of some other makes.

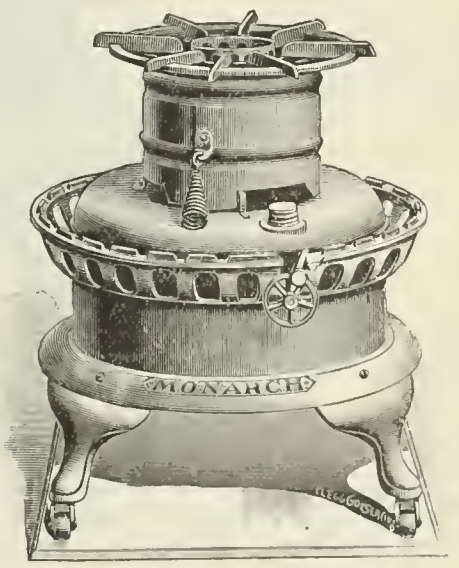
Made in all styles and sizes, same as our A series Workmanship and quality of materials the same. A steel range which for the price ***cannot be excelled.***

Write for Catalogue and Discounts.

Also a complete line of Cast Ranges, Cooks and Heaters. Important and attractive additions for 1897.

The Eclipse Stove Co., Mansfield, Ohio.

Monarch Blue Gas Flame Oil Heating Stove.



The phenomenal success of the "Blue Flame" oil burner of the past two years has created a "Macedonian Call" for a heater made on the same lines, and the "Monarch" steps foward to supply the demand. It has been on the market one year, and for the season of 1897-8 is presented with several important improvements which a year's experience has suggested and we offer it with all confidence in its efficiency, cleanliness, intense power and great comfort.

HERNDON, IA., Oct. 6th, 1897.

The Monarch Stove Co., Mansfield, Ohio.

Gentlemen:—Last year I bought an Oil Stove from you, and now want a new wick.

The Stove has given the best of satisfaction, is perfectly safe, and the best of it is, it furnishes lots of heat and no smoke or odor whatever. It is a gem and a success. We used it all last winter.

Yours respectfully,

F. C. JONES, M. D.

WRITE FOR PRICES AND TERMS.

THE MONARCH STOVE CO.,

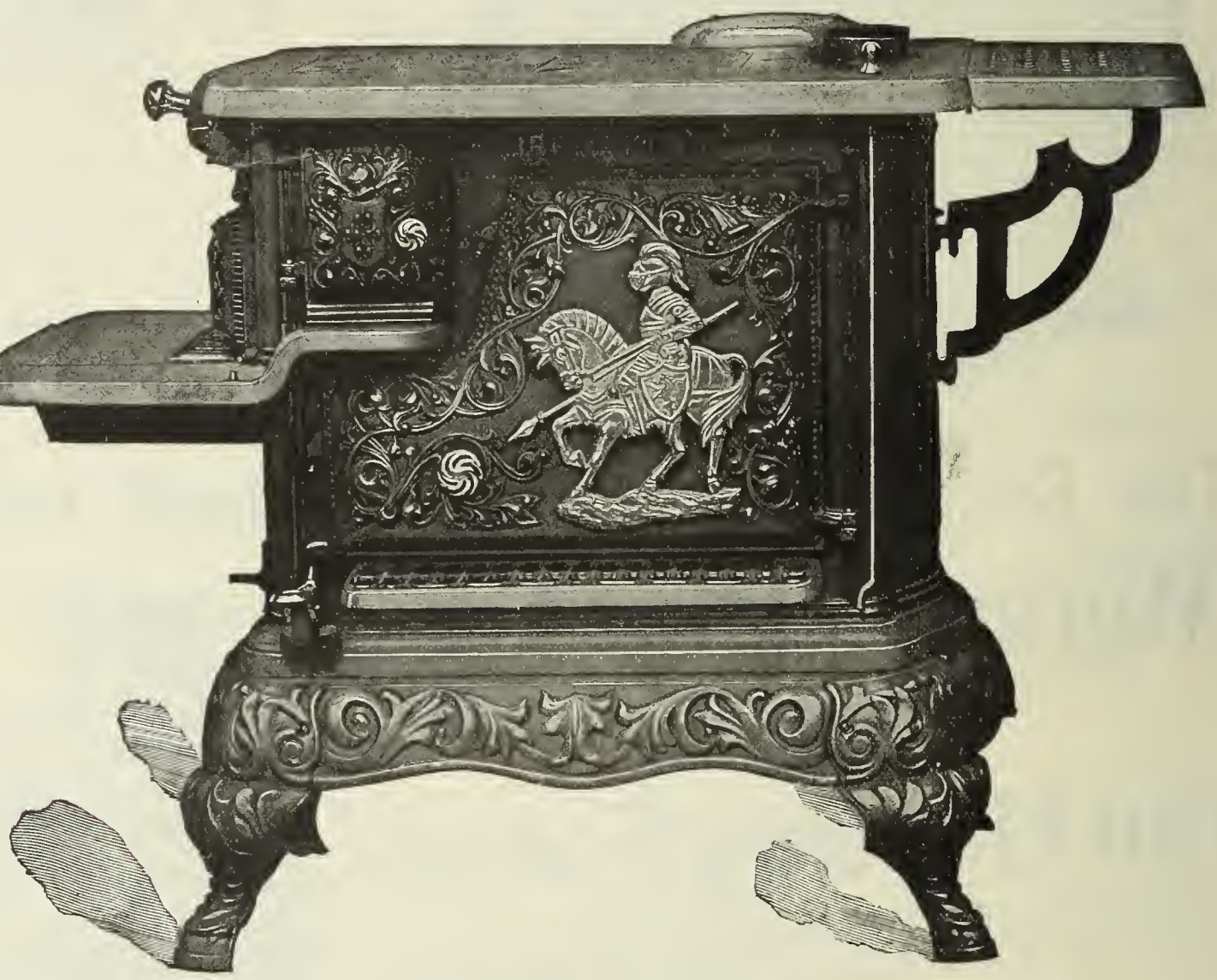
MANSFIELD, O., U. S. A.

B. F. BLYMYER, Suc. to H. R. HAMILTON, 67 Lake St., Chicago, Agent for Ill. and Ind.
DANVILLE STOVE & MFG. CO., Danville, Pa., New York, N. Y., and Phila., Pa., Agents for Eastern States.

IRON KING...

Cook Stoves

Lead in Popularity.



BECAUSE

They are Economizers of Fuel.
They are the Quickest Bakers on the Market.
Their Construction has been Kept up to the Requirements of the Times.
There are More in Use than Any Others.
They are never Allowed to get Old Fashioned.
They are Adapted to all Sections.

CHARLES NOBLE

LIBERTY STOVE WORK

Advance Note

The opposite page shows our IRON KING cook stove as improved this season. Our determination to keep this stove ahead of all others has led us to again make some improvements in its design and construction. We are now finishing the patterns for an entire new line of

Iron King Stoves

We have not waited for engravings before making this announcement, but will have illustrated descriptive matter soon, which we shall be pleased to send when ready. Send us your name and address and we will send you particulars of this, the best selling line on the market.

& CO., Philadelphia.

S, 239 Water St., New York.

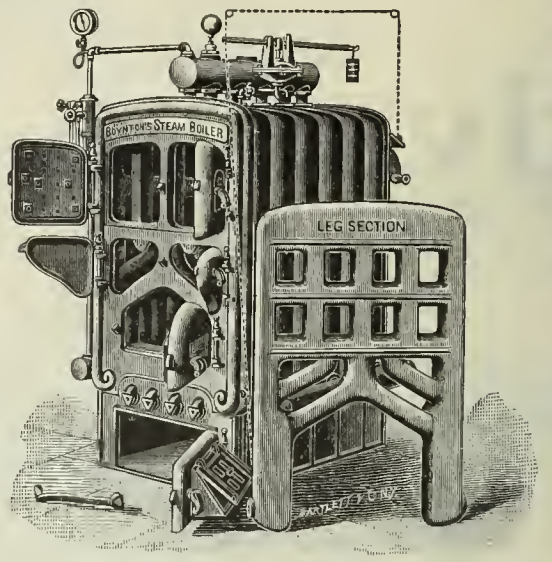
BOYNTON

**HOT WATER HEATERS,
STEAM BOILERS,
FURNACES,
RANGES, ETC.**

BOYNTON'S NEW GAS TIGHT FURNACE.

Remember it is the name BOYNTON we wish you to recall when in want of steam heaters, hot water heaters, furnaces, ranges, etc. Our goods are for sale by best dealers all over the country.

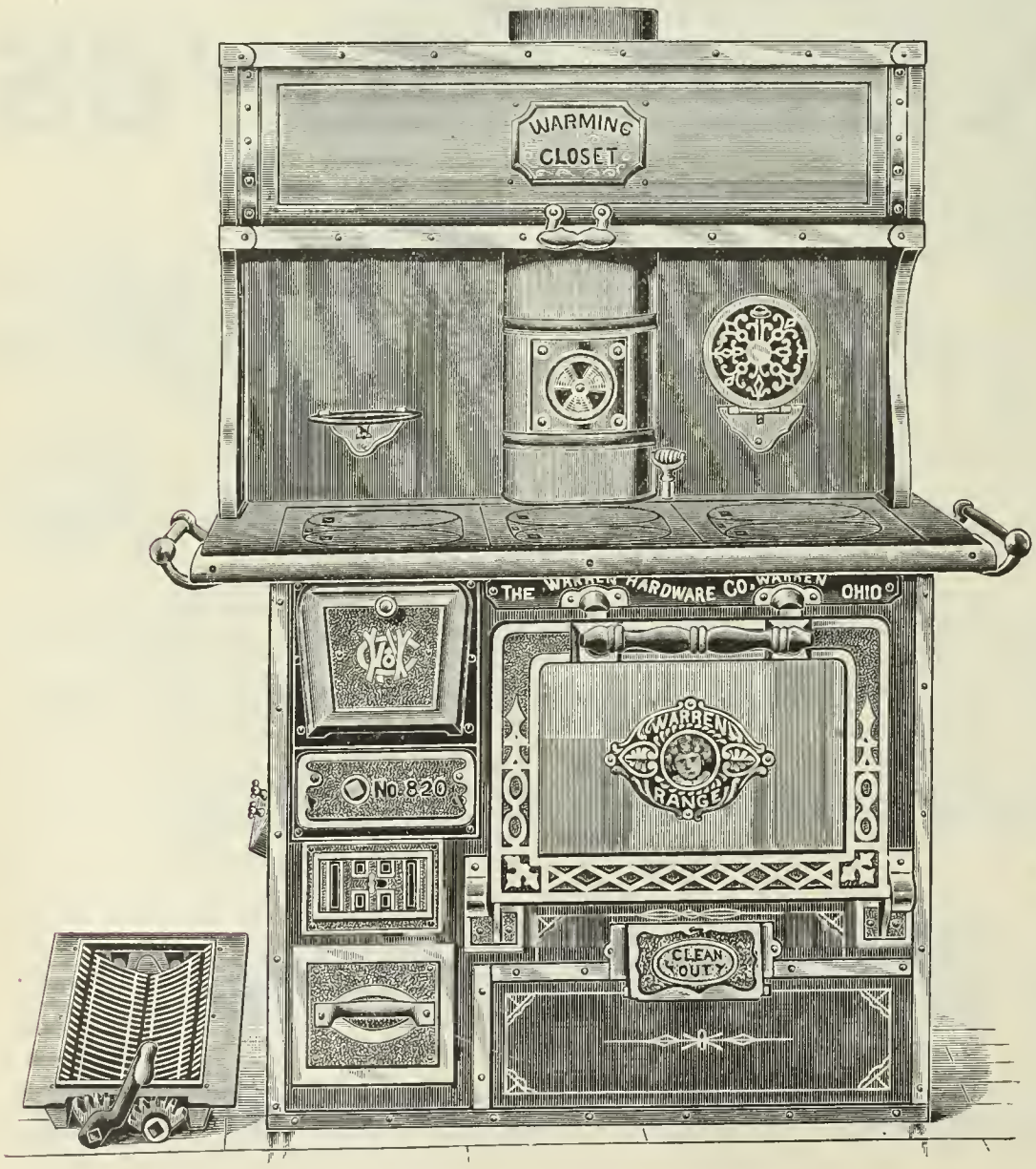
Send for Catalogue and Prices.



BOYNTON'S STEAM BOILER.

The Boynton Furnace Co.,

207 and 209 Water St., New York. 44 and 46 Dearborn St., Chicago.



Warren Steel Ranges.

Made in 16 Sizes.

126 Different Styles.

Substantially built. Heavy in construction. Elegantly finished and fully guaranteed. The line to handle, as they are strictly first-class and up to date. Get our prices, which will interest you. Write for catalogue, which will be gladly furnished.

Manufactured by the

Warren Hardware Co.

WARREN, OHIO.

W. D. SAGER, No. 54 N. Clinton St., Chicago, Ill., Wholesale Agent for Chicago, West and Northwest.

M. F. TALLMAGE, No. 82 Seneca St., Buffalo, N. Y., Wholesale Agent for Buffalo and vicinity.

DANVILLE STOVE & MFG. CO., Danville. Pa., Wholesale Agent for the East.
No. 284 Pearl St., New York, N. Y.
No. 107 N. 2nd St., Philadelphia, Pa.

Hart & Crouse Co.

ROYAL HEATERS.

All Kinds of Heating Apparatus.

UTICA, N. Y.

235 Water St., New York.
79 Lake St., Chicago.

Columbus, O.
St. Louis, Mo.

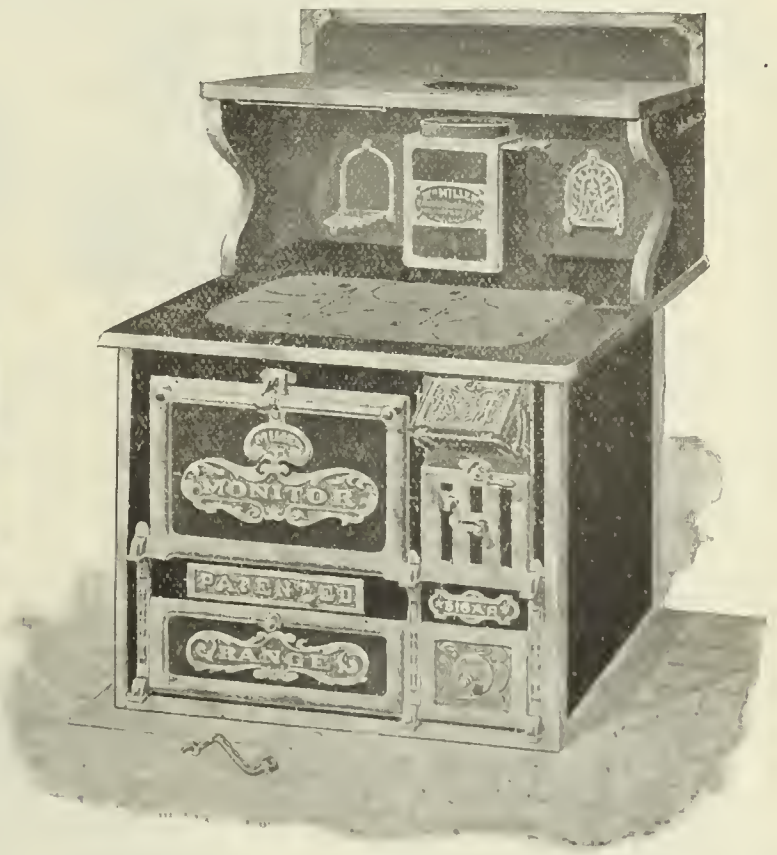
Royal Heaters Lead All Others.

Sold on their Merits, not on their Antiquity.

THE NEW

MILLER MONITOR

WROUGHT STEEL RANGE

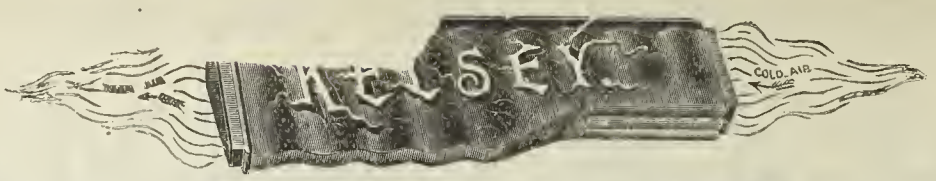


IS THE ONLY ONE MADE ON HONOR.
NO SHODDY MATERIAL,
NO SLOVENLY WORKMANSHIP,
NO FANCY PRICES;
BUT
HONEST GOODS. YOU GET ONLY THE BEST WHEN YOU BUY ONE, FOR THEY ARE GUARANTEED.

SEND FOR CATALOG AND PRICES.

WM. MILLER RANGE & FURNACE CO.,

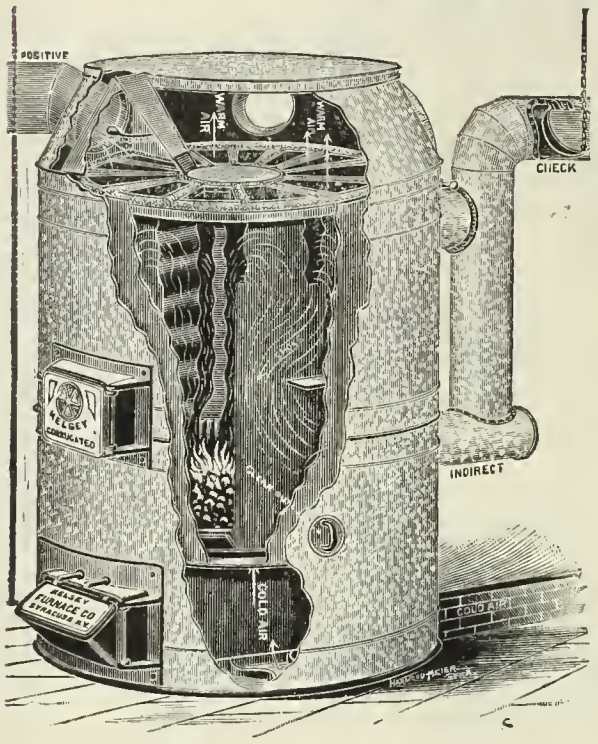
CINCINNATI, OHIO.



WARM AIR GENERATORS

BURN

WOOD, COAL OR COBS.



NELSON, ILL., June 8, 1897.

MESSRS. F. R. TAYLOR & CO., STERLING, ILL.:

Gentlemen:—After the completion of my new residence, four years ago, I investigated the various methods of heating the same, and finally decided upon the Kelsey, and am happy to say, have never had cause to regret my choice; it has given perfect satisfaction, and we have enjoyed an atmosphere, even in the coldest weather, that seemed like a June day.

The air from the Kelsey has none of the hot, stifling, drying properties, but seems pure and fresh as summer.

Our house is very large, but we find no difficulty in heating the whole of the same, and potted plants here thrive as though in the Tropics. We have burned hard coal, wood and cobs, all with equal satisfaction. In fact, it is difficult to express in a few lines the comfort and satisfaction derived from the use of the Kelsey.

Yours very truly,
GEORGE S. RANSOM.

For Catalogue and Prices Write

Kelsey Furnace Company, Syracuse, N. Y.

239 Water Street, N. Y. City. **173 Lake Street, Chicago, Ill.**

JAMES SMART MANFG. CO., Brockville, Ontario, Manufacturers for Canada.

MAGEE

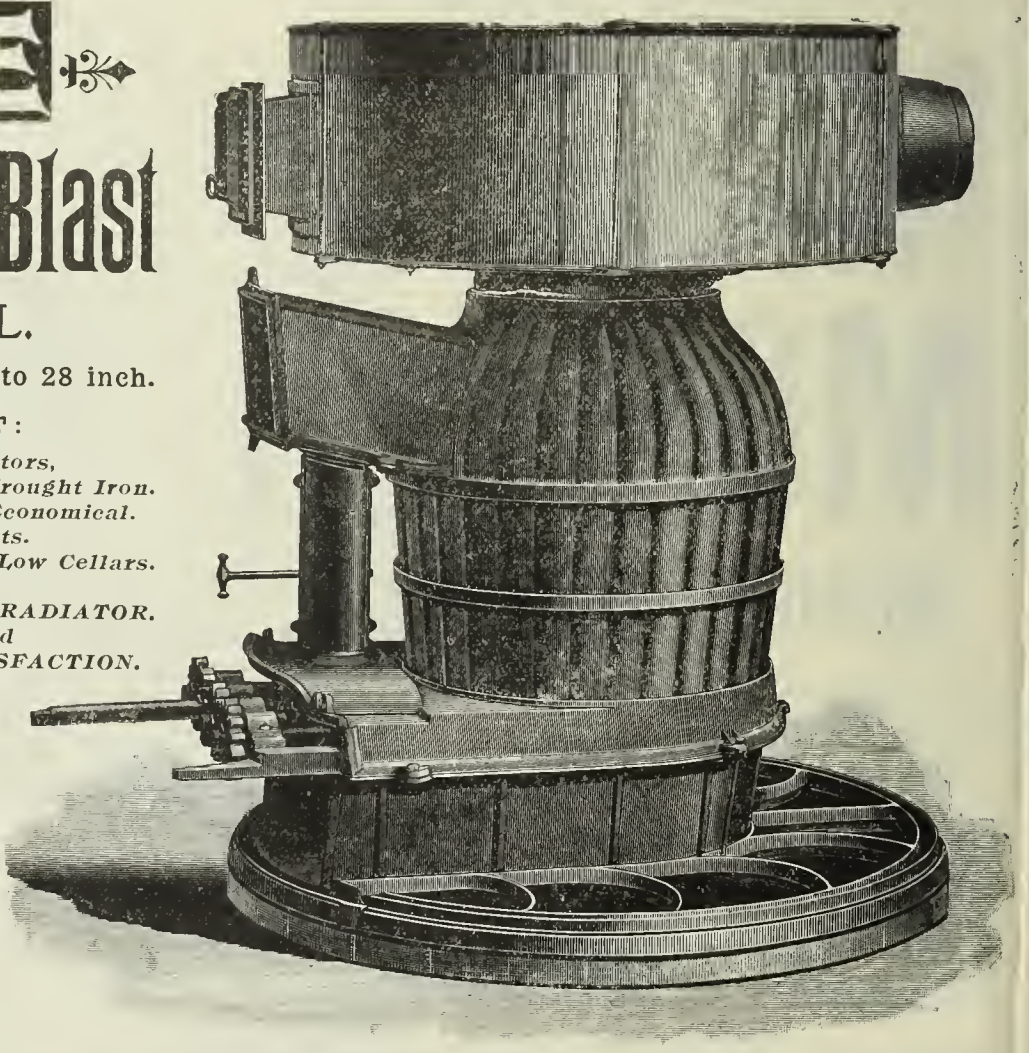
"MYSTIC" Hot Blast

FOR HARD COAL.

Made in 6 Sizes. Pots 18 to 28 inch.

POINTS OF MERIT:

Powerful Revertible Flue Heating Radiators,
Either Solid Cast Iron or Wrought Iron.
Enormous Heating Capacity, and Very Economical.
Perfectly Mounted Cup Joints.
Well Adapted for Low Cellars.
Combustion compelled to make
ENTIRE CIRCUMFERENCE OF RADIATOR.
They are Durable, Gas and Dust Tight, and
WILL GIVE SATISFACTION.



Let us bring home to you one fact: When installing heating apparatus, **use the best.** We make them. You cannot build up a reputation on goods made cheap and for contract work.

Think it over and you must agree with us.

Thoroughly first-class in every particular. We invite comparison with any **Cast-Pot** Furnace on the market.

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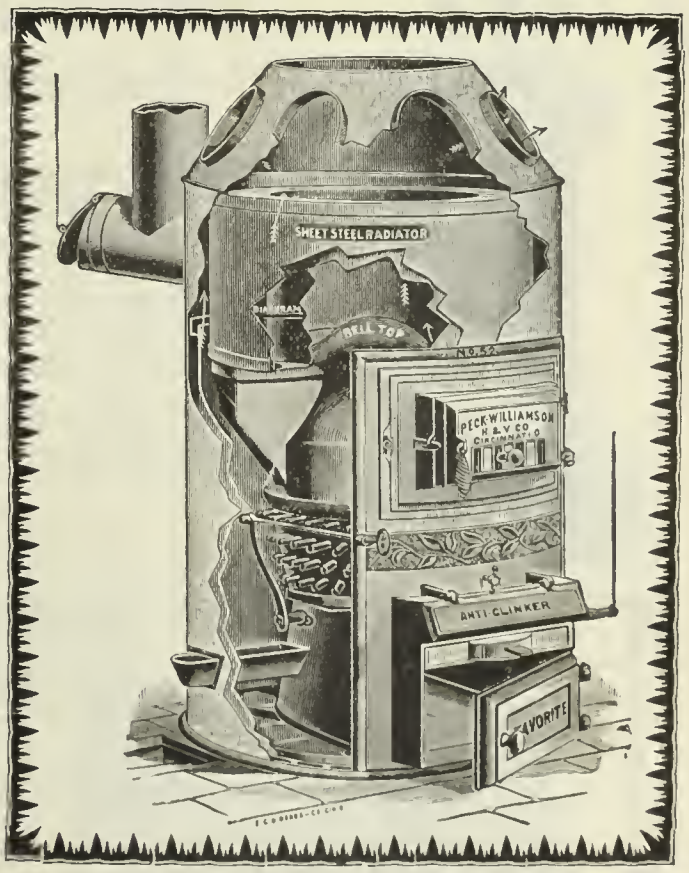

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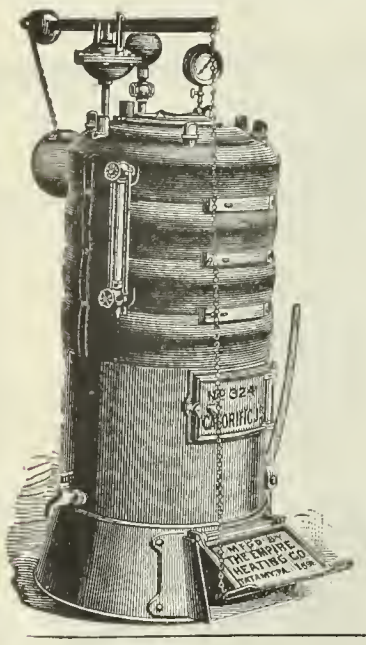

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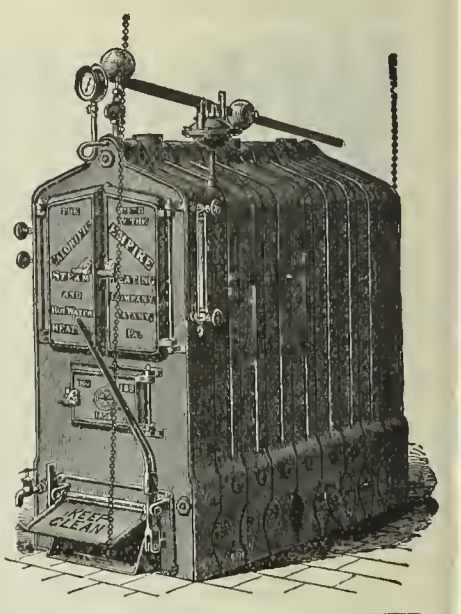

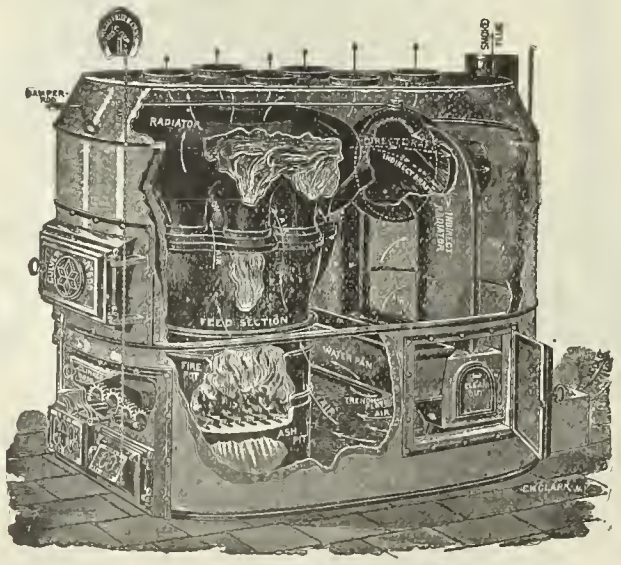

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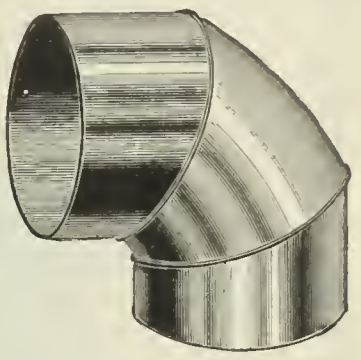

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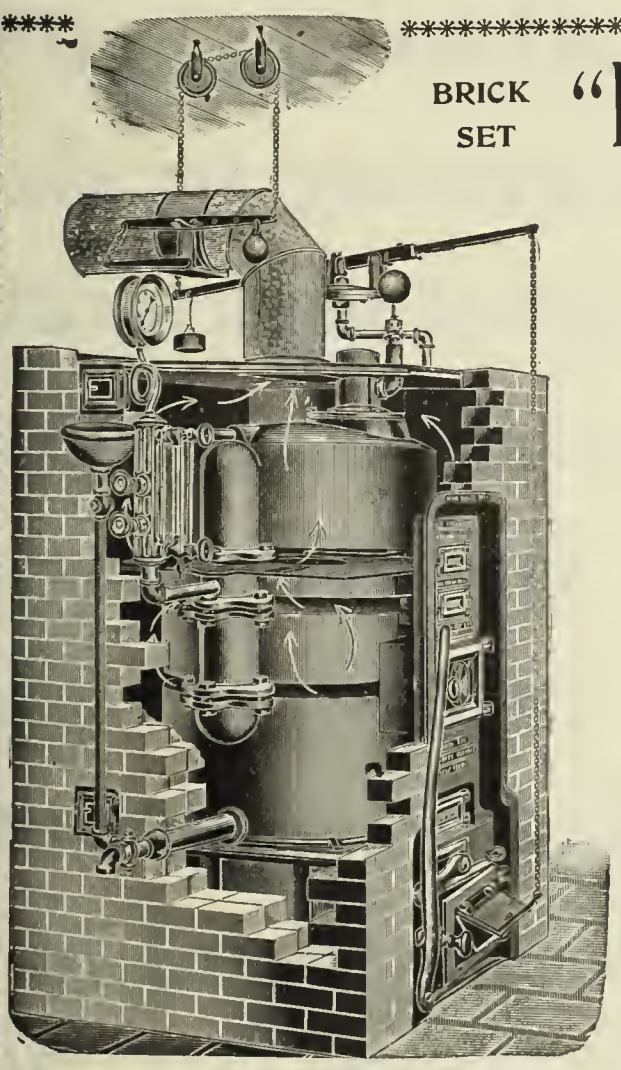

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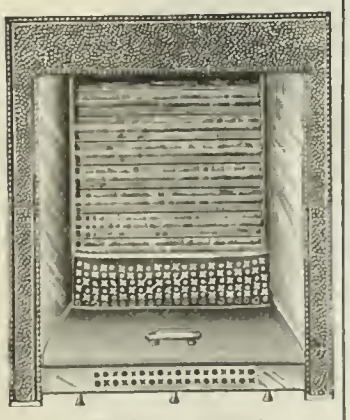

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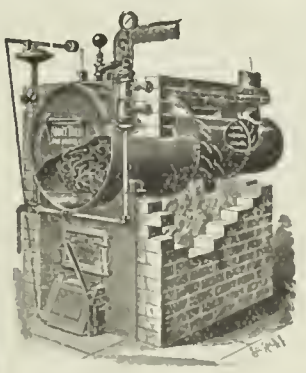

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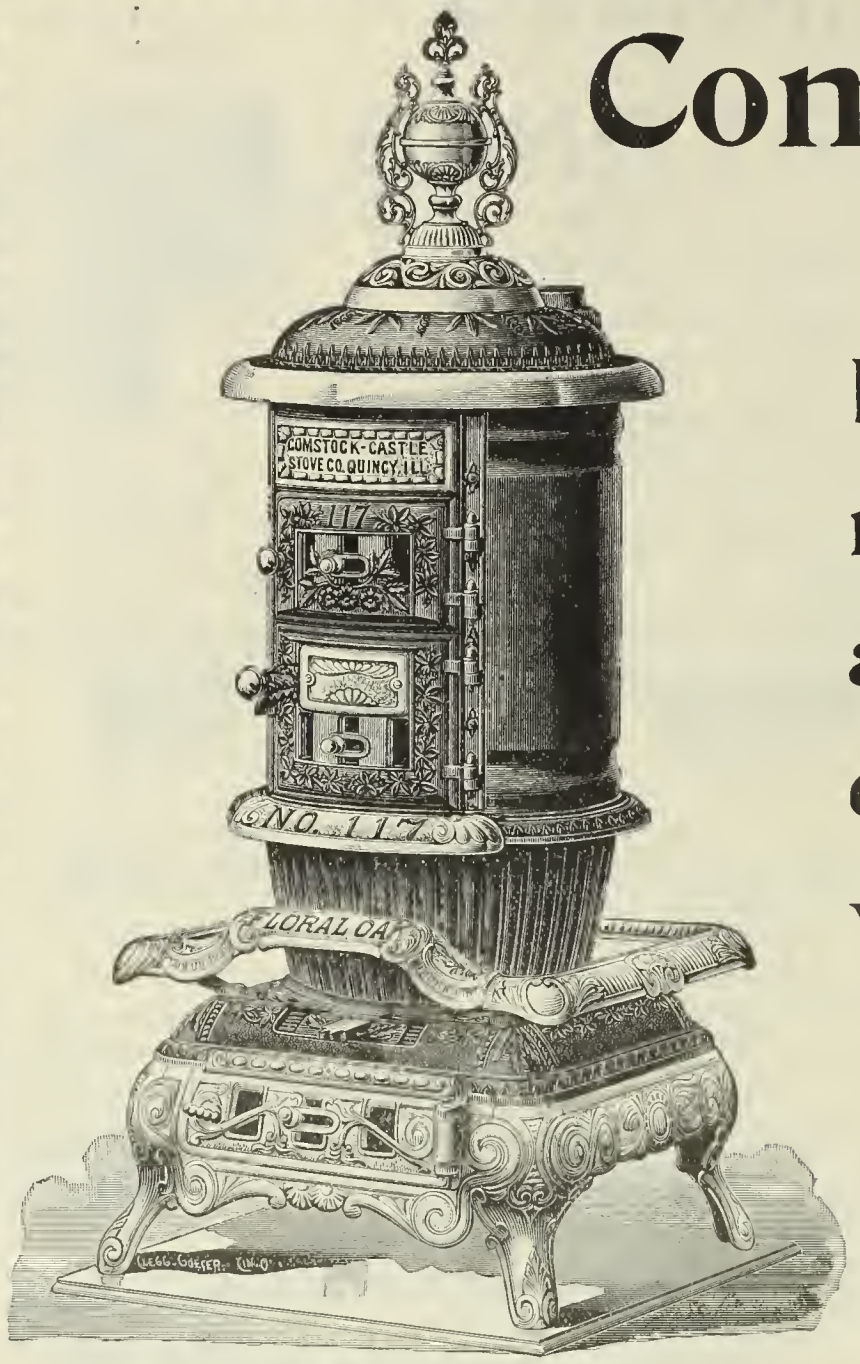

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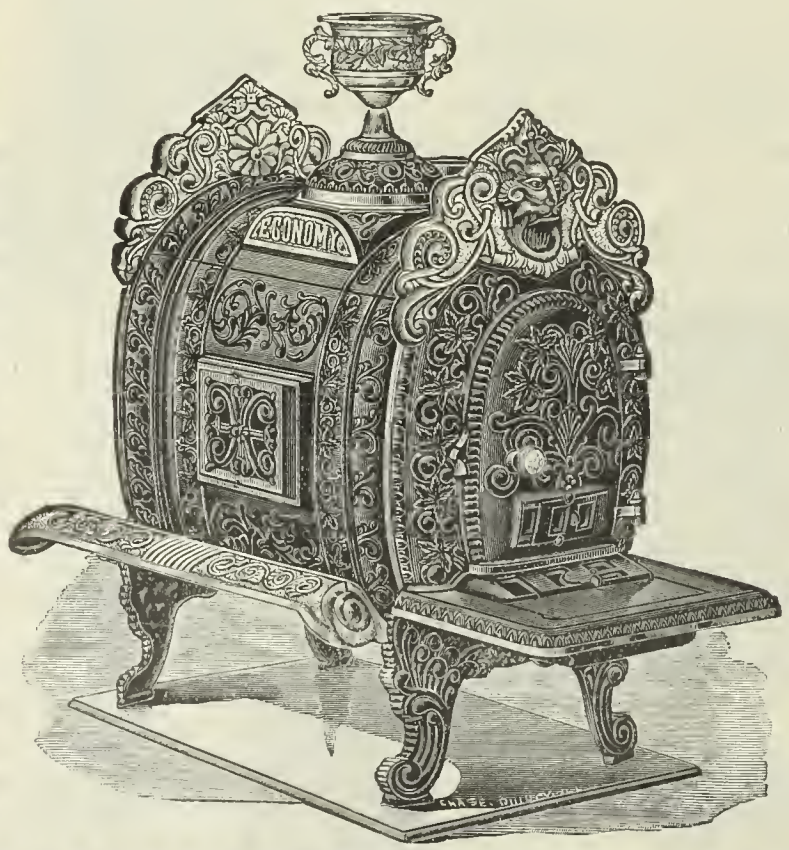

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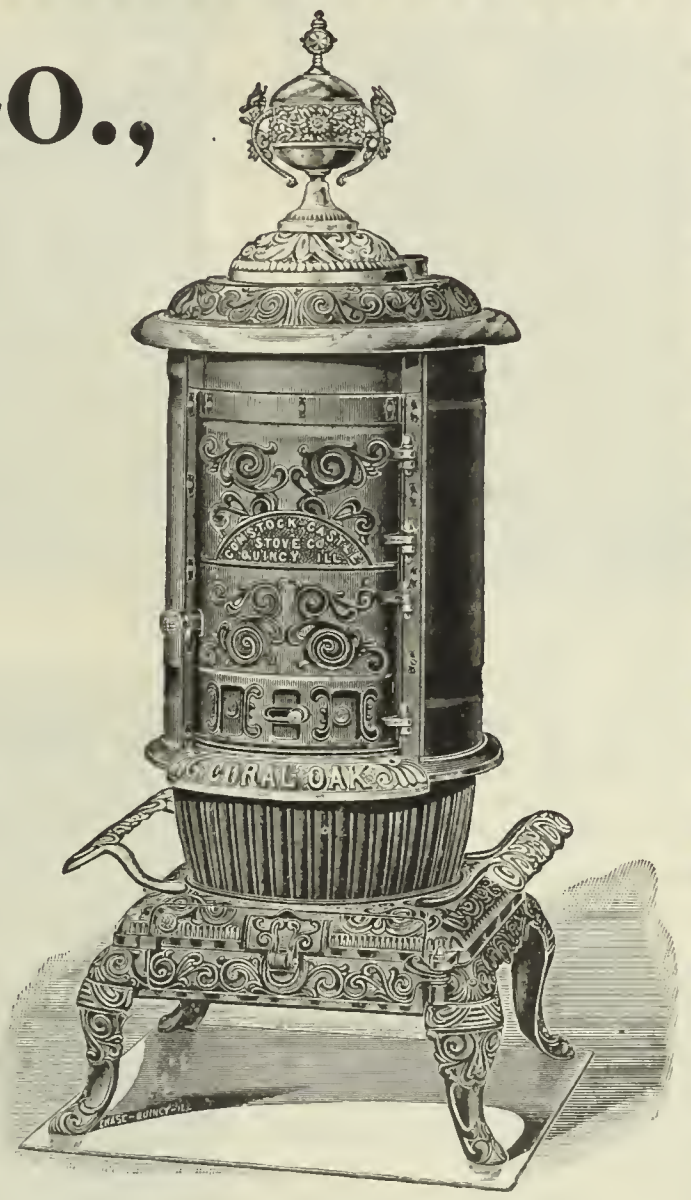

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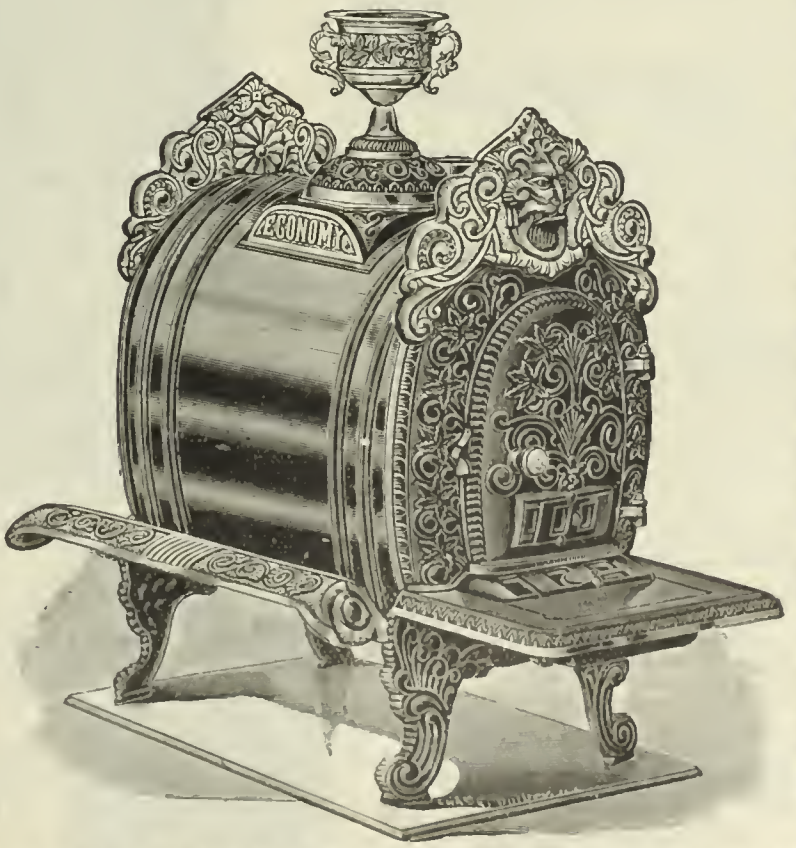

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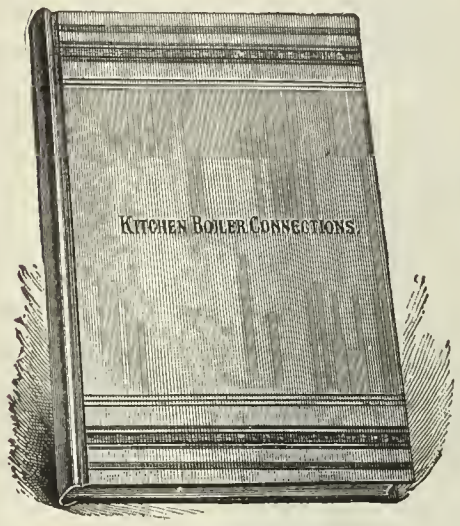

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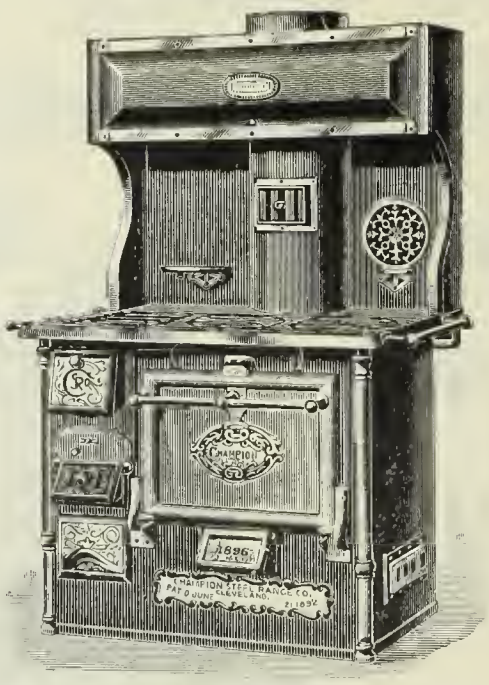

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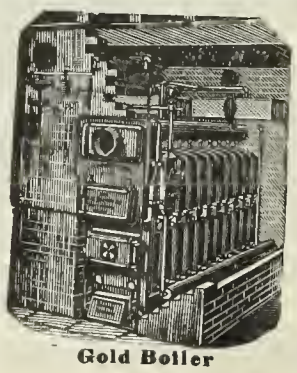

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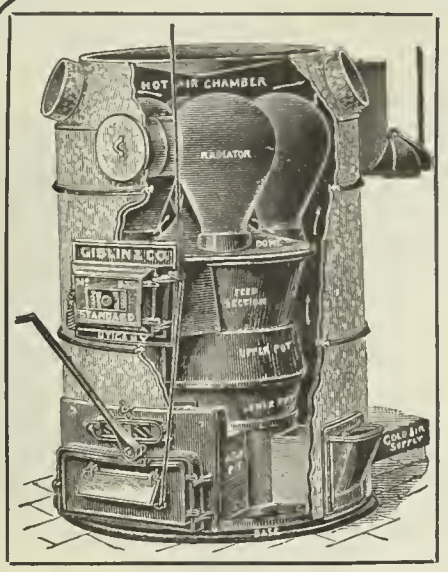

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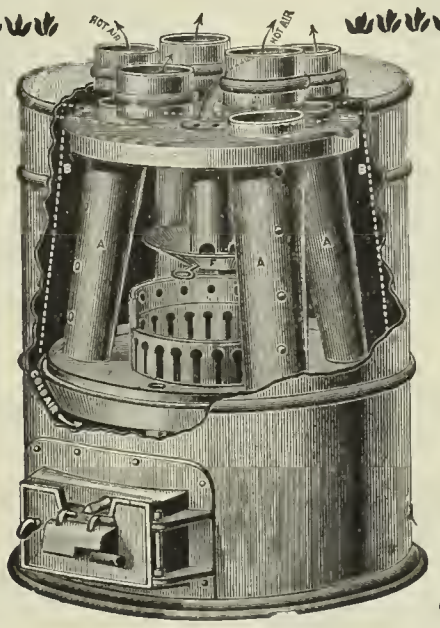

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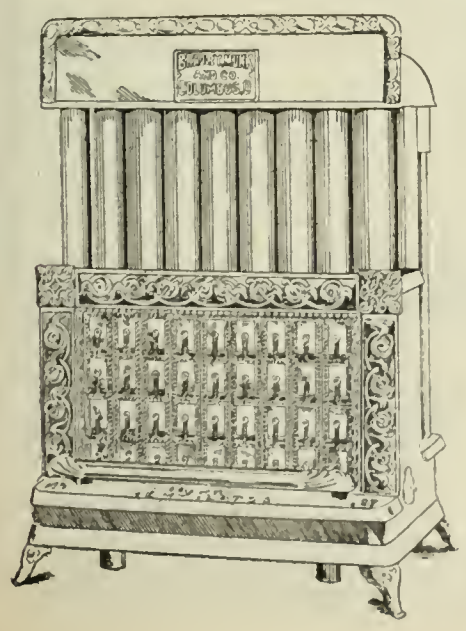

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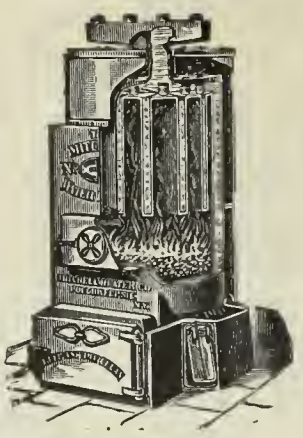

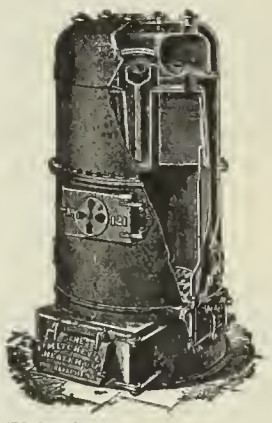

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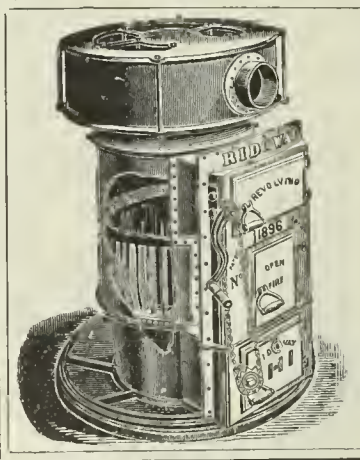

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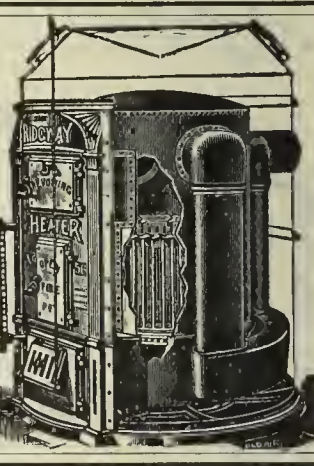

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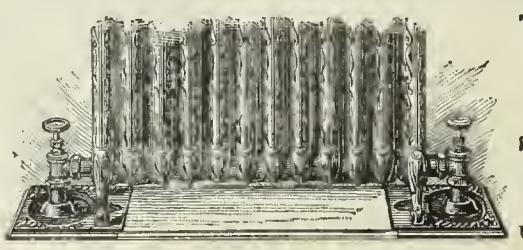

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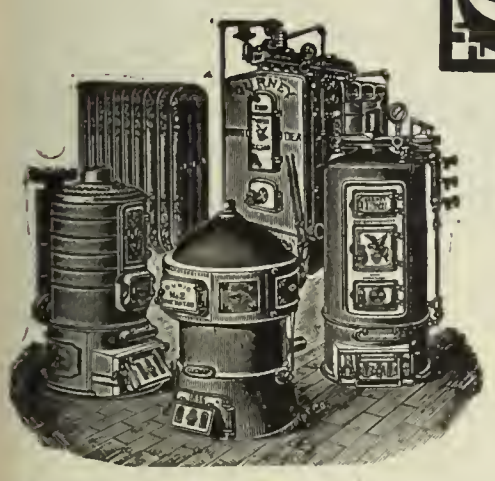

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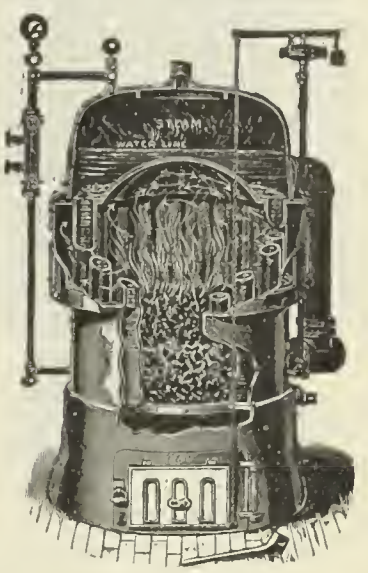

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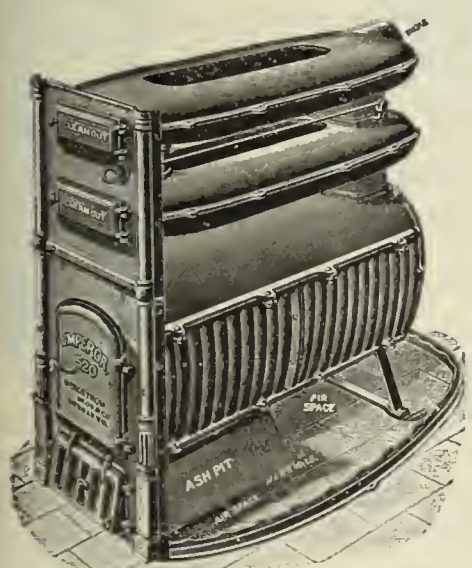

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ECONOMICAL IN FUEL.
The Best and Cheapest Line of Wood Furnaces.
Furnished for either Brick or Galvanized iron Casing.

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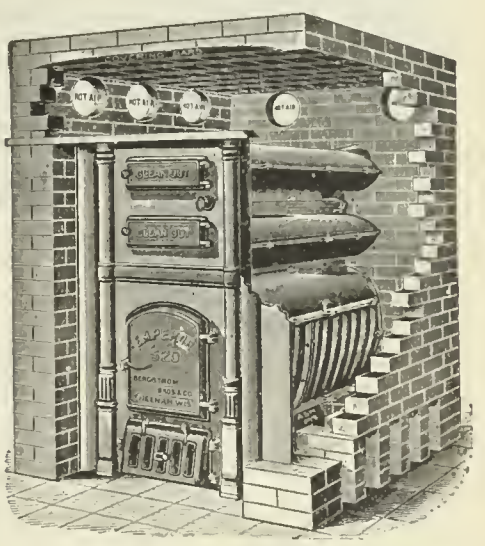

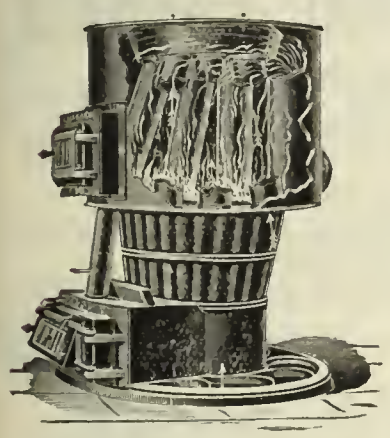

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Don't experiment with your furnace.
Get the **best** in the market.
Write us for particulars, catalogue and prices.

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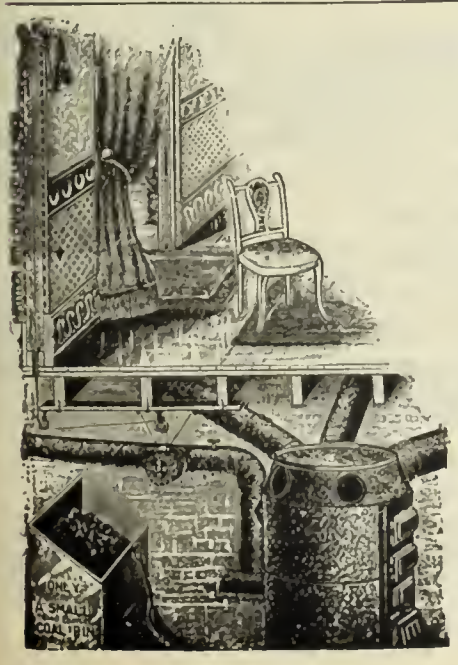
36 La Salle Street, CHICAGO, ILL. The Moncrief-Dowman Co., ATLANTA, GA.



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GOVERNS HOT AIR FURNACES, STEAM BOILERS and HOT WATER HEATERS.

It does not depend upon *Electricity, Vapor, Clock Work*, or *Compressed Air* for power, but simply the contraction and expansion of compact material which is *GUARANTEED* to last *A LIFETIME*. Also its simplicity enables it to *regulate itself* as well as the heater.

Agents Wanted Everywhere.
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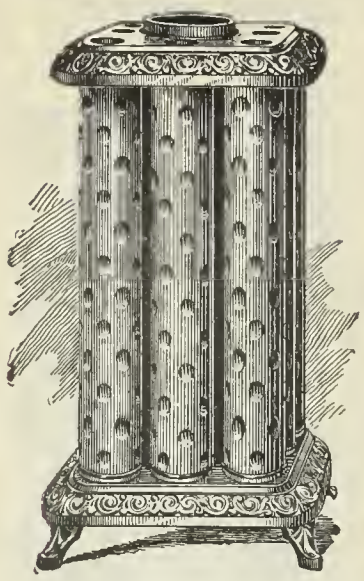

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DO YOU WANT TO INCREASE YOUR BUSINESS?

You can do so. There is no question about it at all. An article that will make one fire do the service of two fires finds many buyers as soon as people know about it.

New Era Radiators

do this, and there is a big profit on every one you sell. Drop us a card and we will send you a circular telling all about these Radiators and our special inducements for handling them. Do it now, so as to be ready for the opening of the season.

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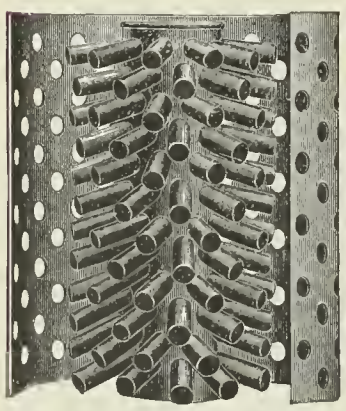
SAVES 1/2 THE FUEL.



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FOR USE ON FURNACES AND STOVES.

Manufactured ONLY by the Rochester Radiator Co.

Made in 7 Styles, and Retails from $3.25 up.

IT DOES NOT INJURE THE DRAFT, LEAK GAS OR CLOG.

Do not be misled by other makes which claim to be

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WRITE FOR PRICES AT ONCE. LIBERAL DISCOUNT TO THE TRADE.

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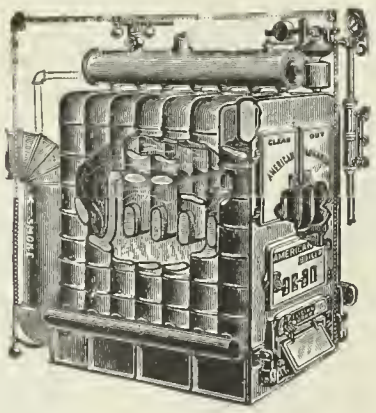
Sediment Accumulation

in heating boilers is a dangerous thing. May choke up the water passages, or cause them to burn out, or get into the valves and cripple them. Sediment does not accumulate in the



"American" Steam Boiler.

It is so constructed that all the water can be drawn from the heater when desired, so that no sediment need accumulate in the sections. *Send for "American" Book.*

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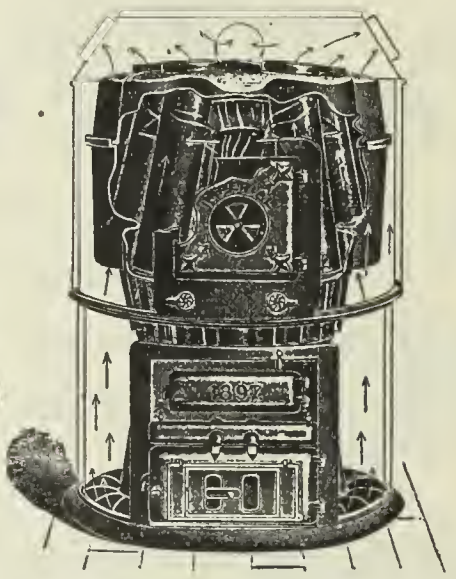

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Enormous Radiating Surface,

Every inch Direct Fire Surface.

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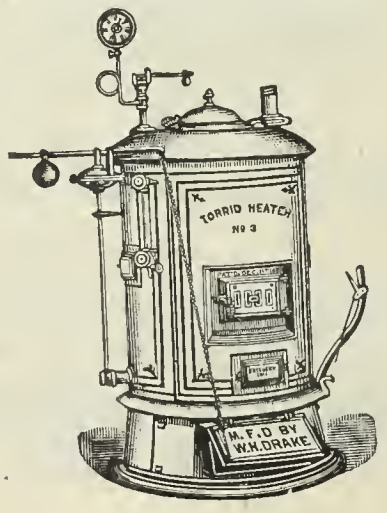
"TORRID" HEATER.

FOR STEAM OR HOT WATER.



IT IS PRACTICAL IN DESIGN.
IT IS SAFE, BEING TESTED TO 200 POUNDS.
IT IS EASY TO MANAGE AND KEEP CLEAN.
IT IS DURABLE.
IT IS SECTIONAL AND EASILY HANDLED.
IT HAS NO PACKED JOINTS.
IT IS SELF-FEED OR SURFACE BURNING.
IT HAS THE TORRID PATENT ROCKING AND DUMPING GRATE.
IT IS LOW IN PRICE.

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HOT BLAST,
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RIVAL AND DREXEL
GREATEST VARIETY.
MOST GOOD POINTS
FOR ALL KINDS OF FUEL.

STANDARDS OF EXCELLENCE.
BEST OF WORKMANSHIP,
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FAULTLESS RANGES
THE VERY BEST.
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READ THIS OFFER!

We will send one or more of these Stove Trucks on trial for a month and take them back if not satisfactory.

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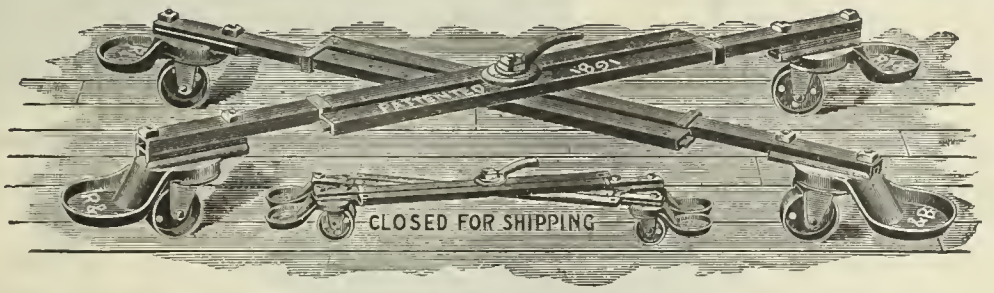

OR RANGE OR RAISE THEM HIGH FROM THE FLOOR.

PRICE, $16 Per Dozen.

It is literally out of sight, and consequently does not detract from the appearance of the stove or range upon it or make them look awkward or ungainly, as all other trucks do.

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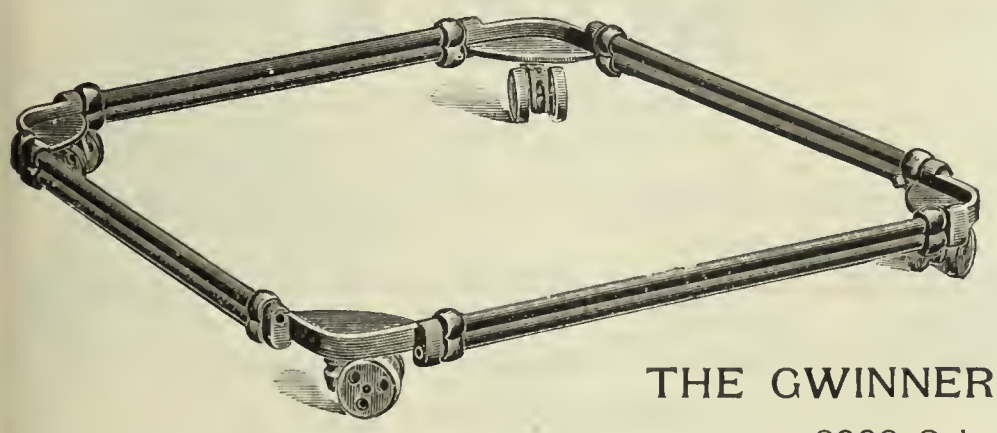

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MADE IN THE BEST MANNER
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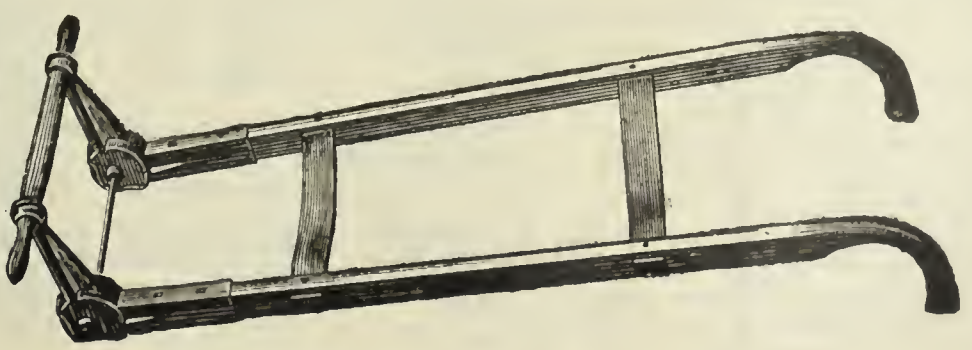

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See the New

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It is the finest Range on the market.

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$5 WILL BUY THREE POUNDS MICA

ASSORTED SIZES.

5 x 6	4 x 5	2¾ x 4
2½ x 3	2¾ x 5	2 x 4½
2¼ x 5	2½ x 4	3 x 3¼
2¾ x 2¾	2½ x 4½	2¾ x 4

Or, same assortment in Best North Carolina for $6.

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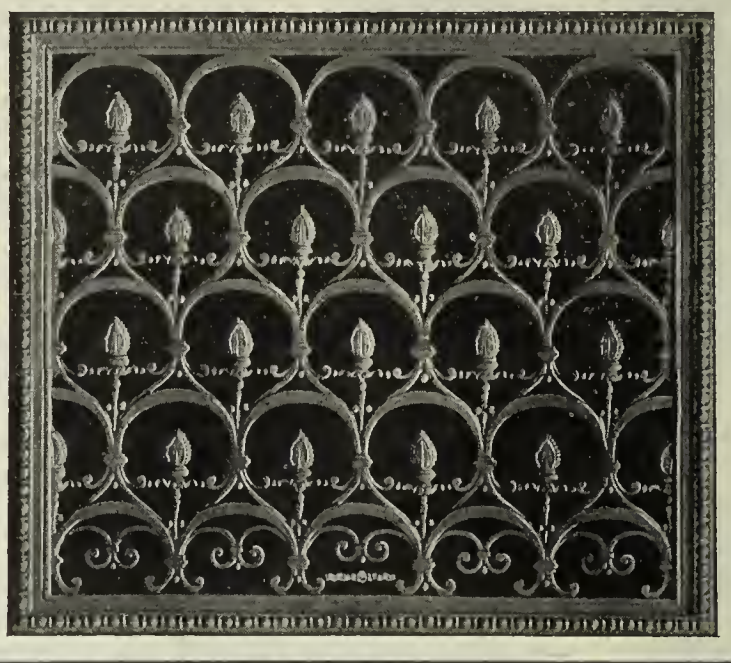

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Who carry in stock Black and White Japanned, Nickel, Brass, Bronze, Copper, and Antique Copper Finishes.

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If you write you saw "ad." in THE METAL WORKER, we will allow 1 per cent. extra discount on first order.

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¼ lb. Each Size.

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Wyoming, · · 2.00	2¼ x 4	
Montana, · · 1.90	2½ x 3	2¼ x 5

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Wyoming, · · 3.70	2 x 4	2½ x 4
Montana, · · 3.55	2¾ x 2¾	2½ x 4½
	3½ x 5	5 x 7

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¼ lb. Each Size.

North Carolina, $6.00	4 x 5½	3 x 4
Wyoming, · · 5.10	2¾ x 4¼	2½ x 3½
Montana, · · 4.95	3 x 3	2 x 4½
	2¼ x 4½	2¾ x 2¾
	2½ x 3	2¾ x 3½
	2 x 3½	5 x 7

ABOVE PRICES NET. NO DISCOUNT.

☞ Mica delivered anywhere in the United States Free of Transportation Charges.

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Ferrosteel Registers

....UNEXCELLED FOR....

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Complete List of Sizes.....

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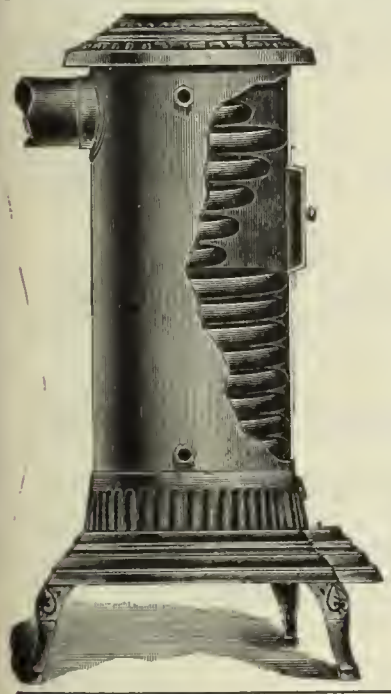

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—— FOR HEATING ——

HOUSES, STORES,
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by the combination of hot air and hot water if desired, or hot water alone.

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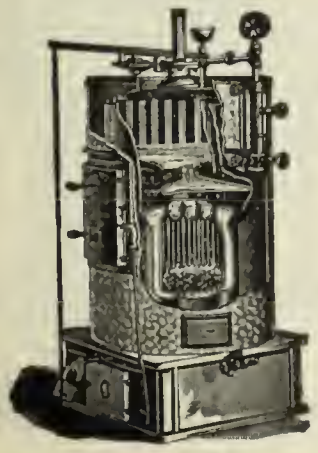

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SPEAKING OF MAN.

Even the "new woman" admits he is "a good thing to have in the house."

SPEAKING OF BOILERS,

The new and up-to-date Steam Fitter must admit that the

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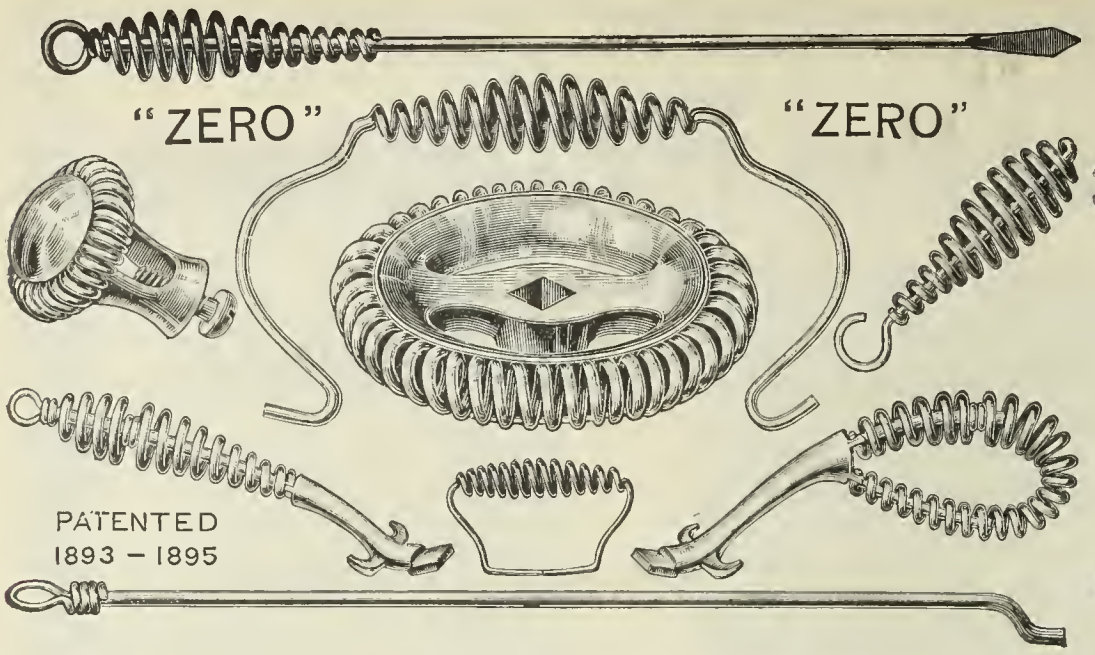
—HERE is one of the last stories from Monte Carlo: While the solemn function of displaying, mixing and shuffling the cards which precedes the beginning of the play was being gone through, a gentleman walked up to the tables, deliberately counted out a lot of bank notes, in value $2,500, and placed them on the black. This somewhat unusual occurrence of staking a maximum before the play for the day had begun naturally attracted attention, and a bystander remarked:

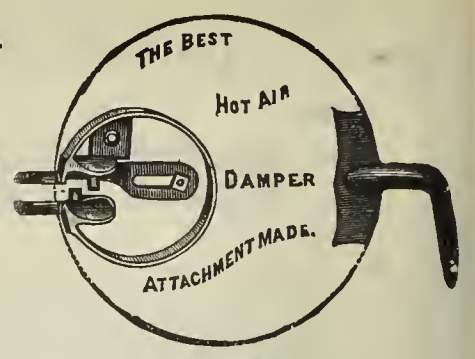
"Rather bold play, sir."

"Well," said the player, "I dreamed last night that I saw the table exactly as it is now, and on the first coup black won."

The cards being duly cut, the tailleur proceeded, watched by the onlookers with unusual interest, to deal out the cards for the first coup, and black won. A suppressed "Oh!" from the bystanders greeted the announcement, and then from across the table came, in tones of agonized entreaty, a lady's voice:

"What did you have for supper last night? Do tell me!"—*New York Tribune.*





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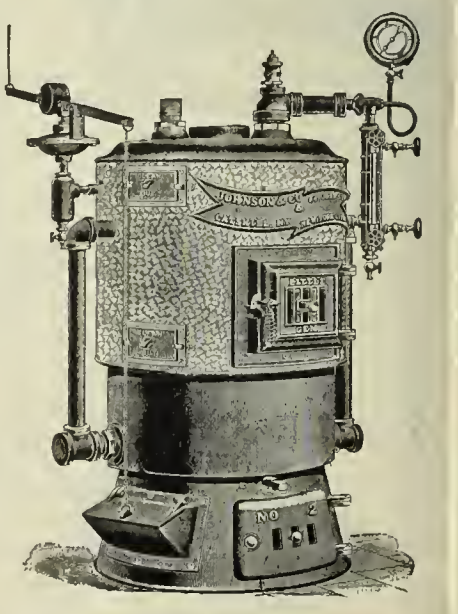

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Is a quick acting, paste polish; gives a jet black, glossy finish **instantly**; will not slop or spill. **No brush** is necessary, and consequently it will not spatter. No smoke, no smell, no dirt, no ruined carpets. Put up in 5c. and 10c. boxes. Write us for prices.
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JOSEPH HUSE & SON,
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"ONE TIME," said the traveled boarder, "I got snowed in on the Rocky Mountains, and the only thing seven of us had for two days to sustain life was a half-barrel of pickled pigs' feet."

"You were, indeed," said the Cheerful Idiot, "reduced to extremities."—*Indianapolis Journal.*

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THE

Manufacturer

to line your stoves with the **BEST LININGS.** A set of our linings in a stove greatly enhances its value.

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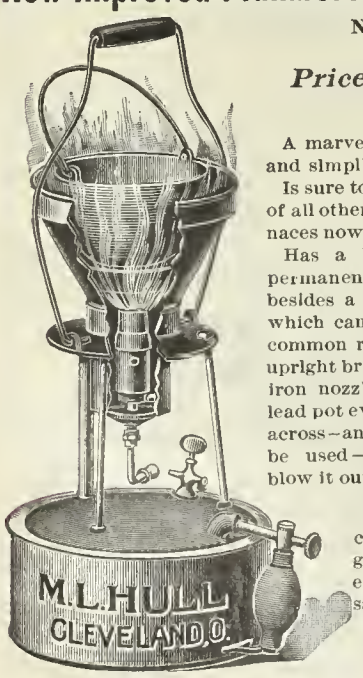
New Improved Plumbers' Furnace



No 8,

Price, $6.00.

A marvel of efficiency and simplicity.

Is sure to take the place of all other plumbers' furnaces now in use.

Has a better tank—a permanently fixed pump, besides a filler screw to which can be attached a common rubber bulb—an upright brass burner with iron nozzle—the nicest lead pot ever shown. 6 in. across—any lead pot can be used—no wind can blow it out.

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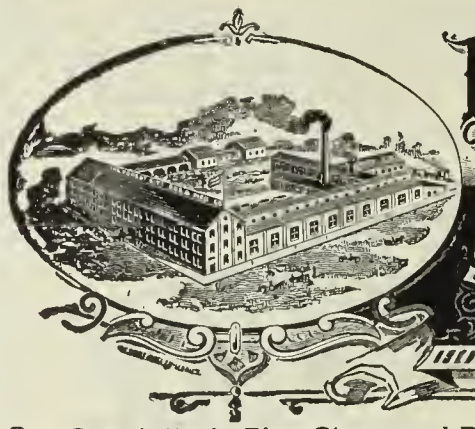

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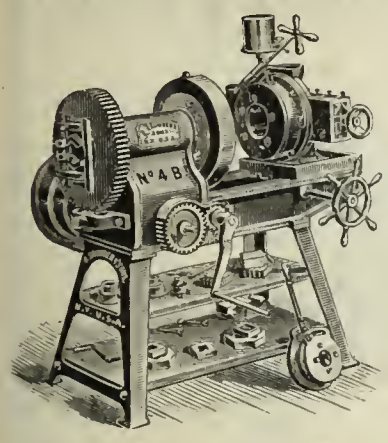

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All sizes ¼ inch to 18 inch for Pipe Mill, Gas and Steam Fitters' use. Tapping Machines for steam-fittings, also

STEAM and GASFITTERS' HAND TOOLS.

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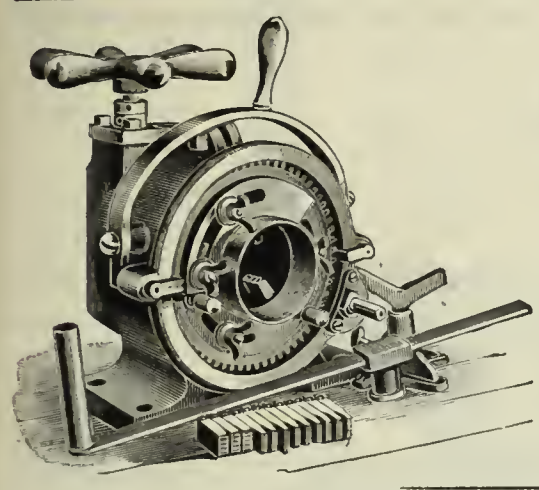

THE FORBES PATENT

DIE STOCK

Two-inch Pipe Threaded with one hand on crank. Ten-inch Pipe Threaded by one man with ease. Send for illustrated catalogue.

CURTIS & CURTIS,

56 Garden St.,
BRIDGEPORT, CONN.

WE BUILD A SUPERIOR LINE

NEW No. 0 THREADING MACHINE.

of PIPE THREADING
and CUTTING-OFF
MACHINES, (Hand or Power,)
STOCKS, DIES and other Tools for
WATER, STEAM and GAS FITTERS.

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139 Centre St., New York. BRIDGEPORT, CONN.

CAN'T WEAR OUT!!

This is a good ball cock, having a

GLASS SEAT,

which will not wear out or be affected by action of water or any acid.

It will stand 140 lbs. pressure and with the high pressure adjustment will stand 300 lbs.

THE N. C. BALL COCK,
(Non-Corrodible).
Send for Circulars and Price.

CRAWFORD & YOUNG, 224 Franklin St., Boston, Mass.

—TRAPPED IN HIS LAIR.—"Pa, what is your busy day?"

"Well, sonny, it is when I stay at home to rest and your mother gets me to do a few little odd jobs around the house."—*Detroit Free Press.*

—AFTER announcing that a baboon had learned to ride a bicycle, a Western paper remarked: "And there are others," which somehow or other seems a true and good thing to say, in spite of its flavor of slang.

VANDERMAN'S

1897 Specialties.

Send us your address, and in return we will send you a catalogue of the best line of specialties in the United States.

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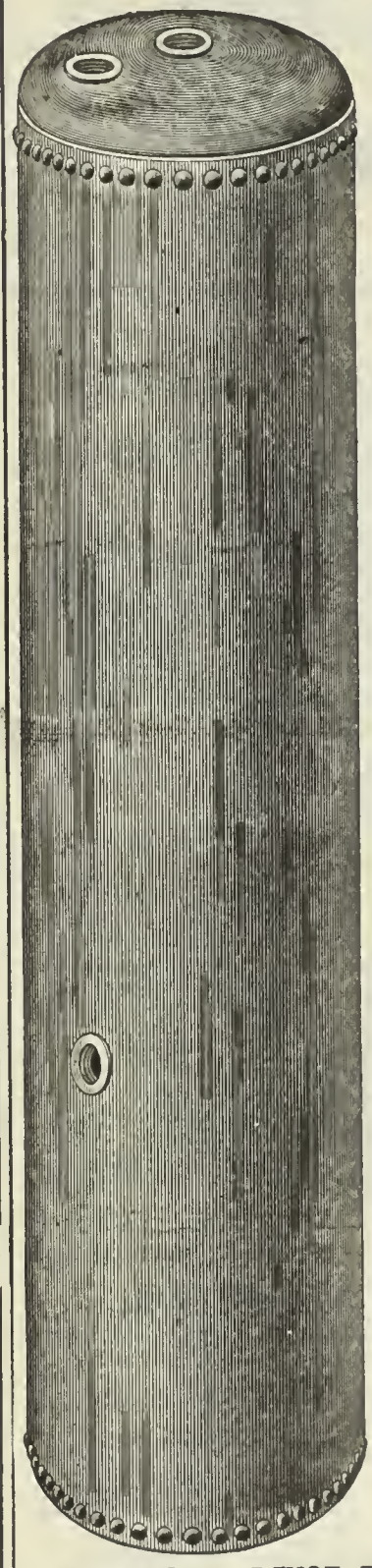

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GALVANIZED RANGE BOILERS.

We operate a complete and extensive plant for the manufacture of Range Boilers, Expansion Tanks, etc. We do our own *Galvanizing*, make our own *Rivets*, and do the drawing-up work of the heads; our customers can therefore rely upon getting a first-class high grade Boiler. It is the best made. We make these Boilers in all sizes, from 18 to 192 gallons capacity; also Boilers with Galvanized Iron Steam Coils inside (horizontal and vertical), Boiler Hangers, Stands and Brackets.

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LEAD PIPE, SHEET LEAD, SHOT,

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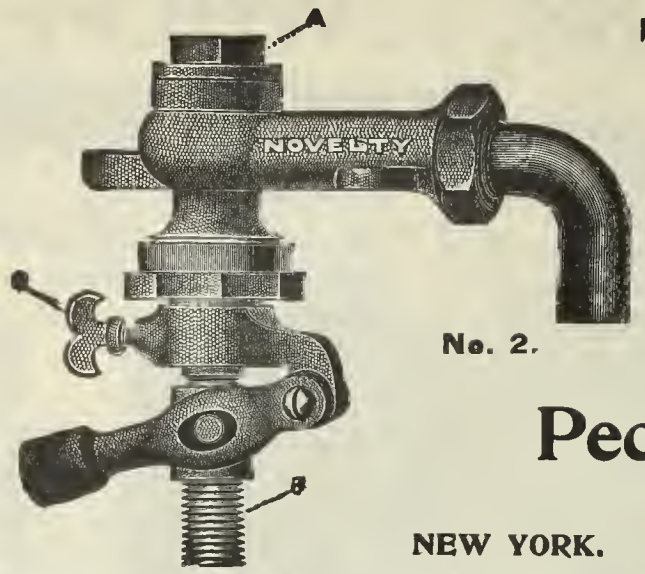
Everything You Want for Plumbing.



No. 2.

The Novelty Ball Cock

(PATENTED).

Top Supply. Made also for Bottom Supply. Noiseless. For High or Low Pressure. Easily Repaired. Write for Prices.

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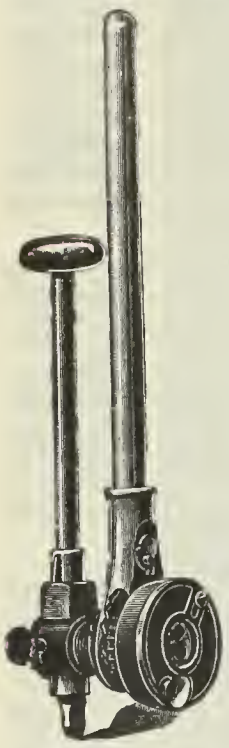

Is an indispensable tool for conveniently threading iron pipe in ditches, under floors in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, $10.00.

No. 2 threads 1 to 2 in. pipe, takes 2½, 3 and 4 in. die, $17.00

For sale by leading jobbers.

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Leather and Rubber WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

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Automatic Beer Pump.

Patented Dec. 4, 1894.
Patented Oct. 15, 1895.

Every Pump Guaranteed

Makes from 13 lbs. to 15 lbs. of air pressure in 4 minutes with one discharge of 10 galls. of water.

NOTHING TO GIVE OUT.

Muddy Water Don't Affect It.

The best, the most reliable, and the speediest pump on the market.

Very economical where water is supplied by meter system.

Send for a circular.

Agents wanted.

THE I. X. L. BEER PUMP CO.

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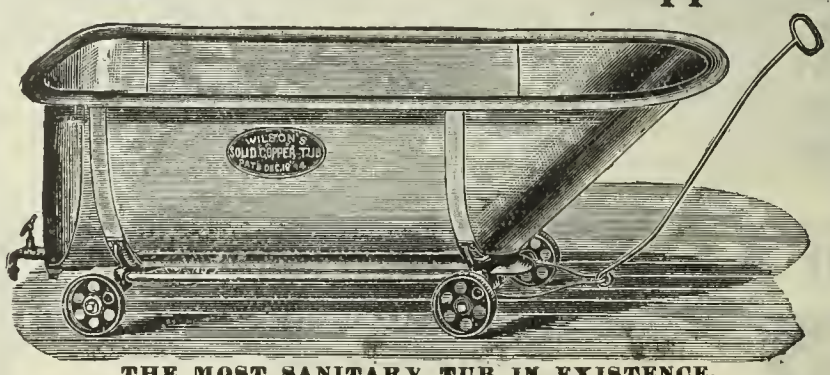
TIME IS MONEY!

Therefore waste no more time in looking further when we have just what you want,

A Double Seamed Solid Copper Bath Tub,



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The only one upon the market.

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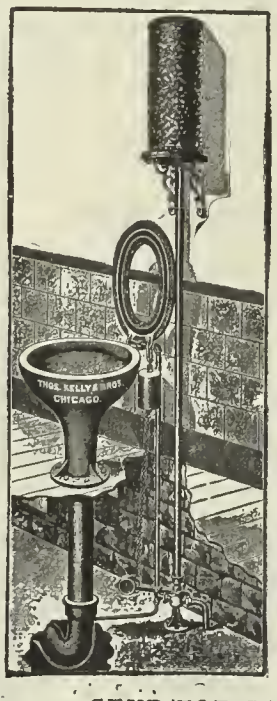
Self-Acting Frost-Proof, After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

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New Style.

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No exposed working parts.

Every intelligent plumber will appreciate this.

The Broughton work has been in use many years.

Unsurpassed for strength and durability.

Every one warranted.

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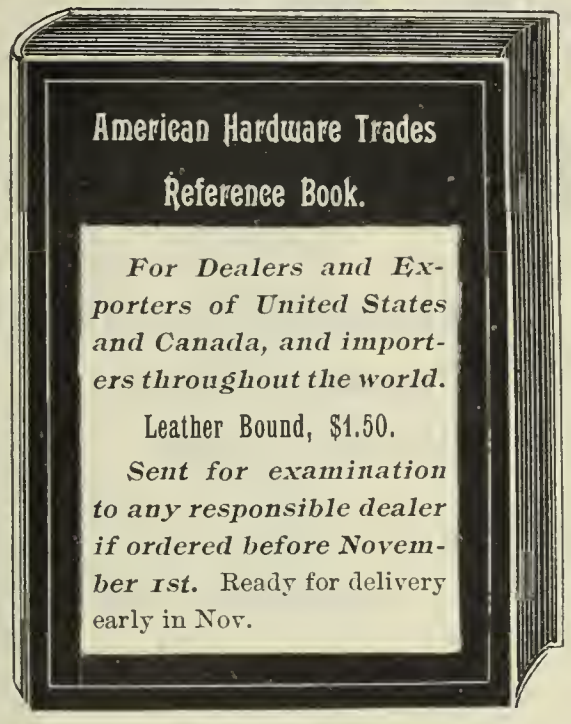
Indexed under 25,000 headings, enabling the user to instantly find all the manufacturers of any article, or who makes any special brand or kind of article.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This is the Emancipation Proclamation that sells the

Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces. Length, 10 inches. Can be sold in all seasons.

Write to Manufacturers for Prices.

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Is original in shape and finish. A little better and unlike the rest. Spiders and Griddles particularly nice. Not so high-priced either.

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HOLLOW-WARE FOUNDERS,
BATAVIA, ILL.

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HOT BLAST GASOLINE BRAZER
for brazing on copper. Very powerful. All brass Seamless Tank. List $6.00.

SILENT FRIEND HOT BLAST COMBINATION GASOLINE FURNACE.
Almost noiseless; no coil; no scale; wind guard; adjustable hoods; steady blue flame. List $6.00.

WHITE MFG. CO.,
115 BAKER AVENUE, SYRACUSE, N. Y. and 40 STATE STREET, CHICAGO, ILL.
H. ROMEYN SMITH, Manager.

The Water Column.

A water closet of the highest grade operated by the

KENNEY
Slow-Closing Valve.

Operates perfectly under the highest pressures.

NO TANK,
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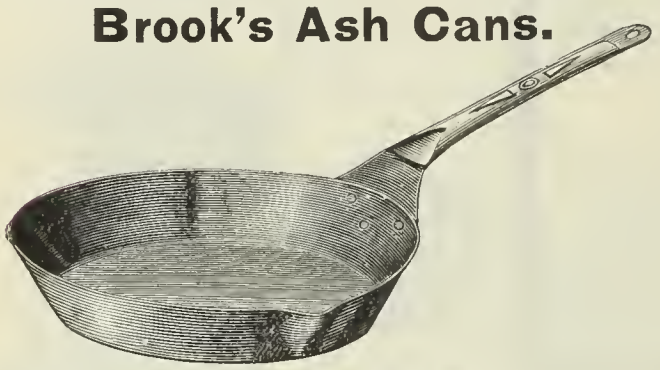

Latest Style of Cold Handle Fry Pans.

ARTICLES FOR

Kitchen, Farm, Dairy, Table, Factory, Lawn, Stable, Cafe.

New Price List,
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Proposals Invited.

LARGEST ASSORTMENT.
STANDARD GOODS.

New Ash and Garbage Can.
Cover Always Attached.

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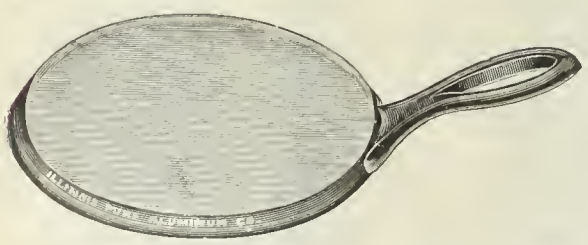

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ORIGINATORS of ALUMINUM STAMPED WARE and Manufacturers of the ONLY COMPLETE LINE

THESE GRIDDLES WILL COOK CAKES WITHOUT GREASE.

INCLUDE A SAMPLE IN YOUR NEXT ORDER.

The oblong are made in two sizes; the round being made in four sizes. Prices within the reach of all.

Write for our ILLUSTRATED CATALOGUE with LOWEST PRICES of LIPPED SAUCE PANS and PRESERVING KETTLES, WHICH HAVE JUST BEEN REDUCED.

GOODS WELL MADE AND GUARANTEED.

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ROME, N. Y.

Makers of the

"ROME" Nickel Plated and Polished Copper

STOVE FURNITURE.

Tea Kettles, Coffee Pots,
Range Kettles, Wash Boilers,
Tea Pots, Stove Tanks,
ETC., ETC.

SPECIALTIES IN SILVER LINED WARES.

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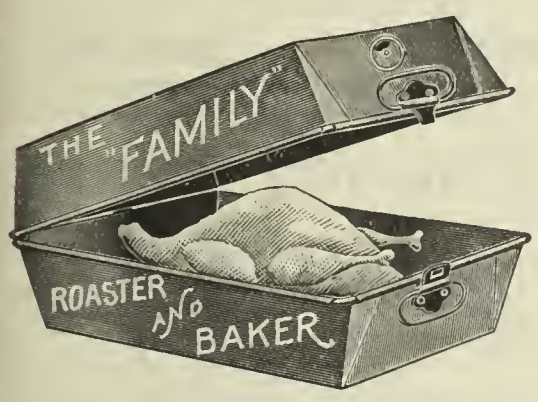
ROME MEANS PERFECTION.

We Wish to Introduce to You Our New

"Family" Roaster and Baker . . .

Made from Black Smooth Steel.



Nos.	10	20	30
Inches	8½ x 12½	10½ x 15½	12½ x 17½

The "Family" Roaster and Baker is a well made double roasting pan, the upper part of which is ventilated.

The two parts are joined by a hook hinge, and when closed are held securely together by this hinge in the back and a tongue in front, which slips through a slotted clip that is riveted to the lower part.

Include a sample lot in your next shipment.

THE SIMPLEST AND BEST ROASTER MADE.

MANUFACTURED BY

KIECKHEFER BROS. CO., Milwaukee.

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HARDWAREMEN=MORE MONEY

can be made by displaying your stock effectively. Learn how others do this by reading "**The American Hardware Store**"~a book full to overflowing of tried ideas and successful methods of hardware display and arrangement gleaned from hundreds of dealers. Three Dollars buys 450 pages, 500 illustrations and many money bringers.

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Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

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NEW All Iron, Galvanized SAFETY COAL SIEVE AND COVER.

No wooden hoop or cover to break; will not rust, and is just the thing for HOT ASHES; and used on our **SAFETY ASH BARREL** is DUST PROOF.

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Also makers of a full line of Galvanized Sheet Iron Wares, Factory Fire Buckets, Oily Waste Cans, Garbage Pails. Chamber Pails, Coal Hods, Oil Cans, Ash Barrels, etc.

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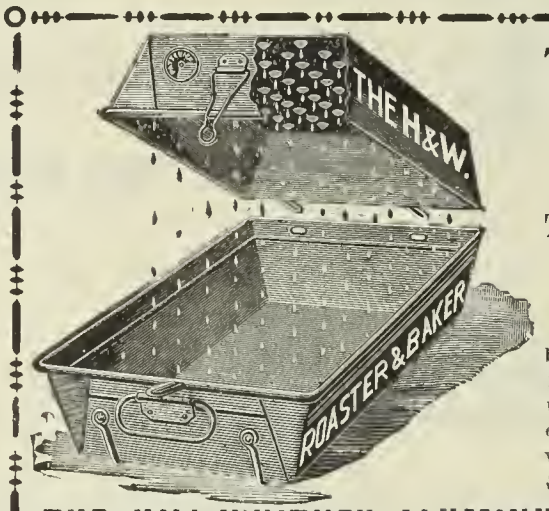

The Only Perfect Self-Basting Baking and Roasting Pans.

The Latest improved and Most Perfect Pan in Use. Made of Planished Steel.

The Self-Basting "H. & W." also combines *all* the advantages of other pans; its simplicity of construction enables the user to adjust and handle it readily; very durable and easily cleaned. The *only* Pan with *Indentations in the Top, making Self-Basting Positive.* See cut.

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High Grade Enamel Ware.

This Trade Mark on bottom of each article.

DOUBLE COATED and ABSOLUTELY PURE

AGATE NICKEL-STEEL-WARE L & G MFG. CO.

Contains no **ARSENIC, ANTIMONY, LEAD** or other poisonous ingredients.

Others may claim purity, we alone substantiate it by chemist's certificate attached to each article.

"We have made a critical examination of the products of nearly a score of the manufacturers of such goods, and the only articles of the kind found to be absolutely free from all the dangerous contaminations of which mention has been made are those known as 'Agate Nickel-Steel Ware.' The makers of this ware possess an exclusive patented process by which, through the intervention of a coating of nickel, the impervious or enamel coating is caused to adhere to the steel, thereby doing away with the necessity of a lead bath or the employment of antimonial or arsenical preparations to achieve such results."—C. H. Brace, M. D., in *American Journal of Health.*

FOR SALE BY ALL REPUTABLE DEALERS.

Write for free booklet containing startling information about

ENAMELED COOKING UTENSILS.

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KEEP YOUR HANDS CLEAN.

THE PARKS STOVE POLISHING MITTEN AND DAUBER

Is a great improvement over the old stove brush for blacking stoves, **without getting a speck of blacking on hands.**

The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth.

The Dauber is also made of sheepskin, with the wool on, and so shaped as to readily get the blacking into all crevices and corners. It is also adapted to polish russet and patent leather shoes, cleaning windows, furniture, etc.

MANUFACTURED BY

PARKS & PARKS, - Troy, N. Y.

—HIS ONE AMBITION.—He was in the dock. He was in the dock for appropriating the property of his fellow man, and the prosecuting attorney was taking a spin at him.

"So you think you can't help being a thief?"

"Yes."

"Father a thief before you, was he?"

"Yes."

"Mother a kleptomaniac?"

"Easy."

"No other calling congenial to you?"

"Only one thing, sir."

"And what is that one?"

"I'd like to be a lawyer, sir."—*Boston Budget.*

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METAL WORKER
PATTERN BOOK.

A Treatise on Pattern Cutting as Applied to all Branches of Sheet Metal Work.

By GEORGE W. KITTREDGE.

430 Pages; 744 Illustrations; size, 10 x 13 inches, Cloth Bound, Price, . . $5.00.

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Printed from new type with a new and improved arrangement, especially convenient for reference and study.

Parts of the former treatise, entitled The Metal Worker Pattern Book, have been utilized in the preparation of this

GREATLY ENLARGED AND IMPROVED WORK,

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218 Problems are now given,
75 of which are entirely new

The greatest care has been taken with the explanatory portions of the work, enabling the student, without any previous training in mathematics and drawing, to become a FINISHED PATTERN CUTTER.

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This work in its perfected form is a complete

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for Tinners, Cornice Makers and Sheet Metal Workers, all of whom should be provided with a copy.

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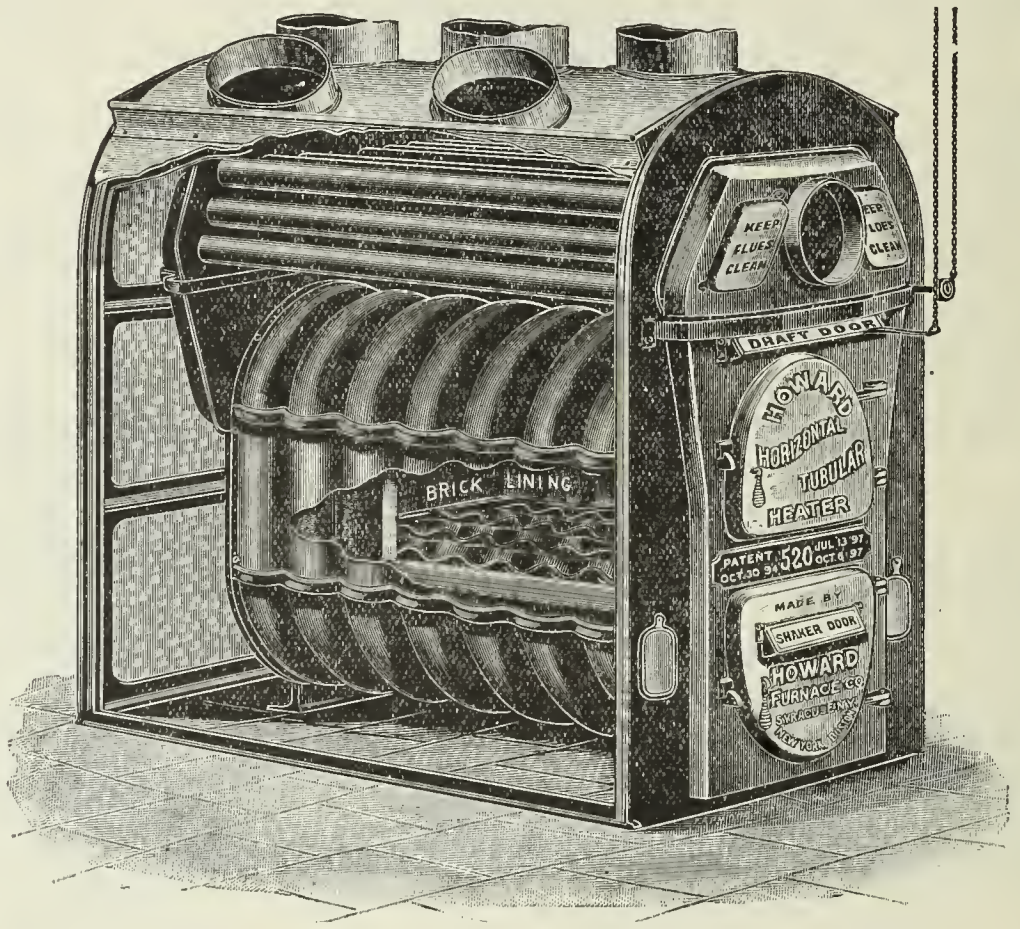
DAVID WILLIAMS COMPANY, Publishers, 232-238 William St., New York.

On the Right Track

With this Furnace the chemical change which takes place in the combustion of fuel is obtained in the most perfect way without waste of heat. It is built on the well-known air-tight principle. This means a radical difference in furnace construction. It means new ideas, advanced thought and progressiveness on our part. To every dealer in the land it means a new furnace. We are desirous to make it known. We solicit questions about it. Write us to-day.



Patented: Oct. 30, 1894. July 13, 1897. Oct. 5, 1897.

With a Hollow Front

It sets men thinking. The construction is not ordinary. The front assists in supplying to the fire a hot draft. Inspection shows a peculiar and distinctive arrangement of dampers. A fire in this furnace can be held under control to meet the most exacting requirements. The capacities are warranted to be as published.

THE MAKERS,

Howard Furnace Co.,

Syracuse, N. Y.

NEW YORK BRANCH,
231 Water St.

BOSTON BRANCH,
198 Spruce St., Station H (Chelsea).

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 30, 1897.

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Volume XLVIII.....No. 18.
Index to Reading Matter.....Page 72.

The Business Situation.

No elements of extraordinary interest have been contributed to the business situation during the past week. Mercantile reports from various quarters and the statements of local business men indicate a somewhat slower movement of trade than was the case a few weeks ago, and the advancing tendency in prices seems to have suffered a check in some directions. The falling off is naturally most pronounced in the South, where the yellow fever quarantine hampers trade to a material extent. But it is also apparent in the East, where consumers of goods do not, at the moment, show much disposition to buy with a free hand or to anticipate their wants to any extent. In the West and Northwest, however, trade is quite brisk. The setting in of colder weather is stimulating the demand for winter goods, and the improved financial status of the farmers enables them to purchase more freely than they have been in a condition to do for years. Looking over the field at large, it is beyond question that the great majority of people throughout the country are suffering very much less from business depression than formerly, while the improvement in large sections is radical. Merchants and manufacturers, while expecting a fair average business, do not look for any material increase in its volume during the balance of this year. But all unite in the expectation of a steady increase in business activity from the opening of 1898. At the same time evidence of an unusually large amount of current business is seen in the heavy returns of bank clearings—an infallible barometer. Last week's aggregated clearings reached a total of $1,304,740,542, a decrease of a fraction of 1 per cent. from the previous week's total, but 30 per cent. over the corresponding week of last year, while the clearings for the past four weeks have been at the rate of more than $68,000,000,000 a year, the largest figures ever reached. Current railroad earnings are from 12 to 15 per cent. better than a year ago. Exports of agricultural and manufactured products continue extraordinarily large, while imports are relatively light, thus swelling the foreign trade balance in our favor. The gold reserve is well past $150,000,000, and is growing. Money is in abundance in the banks, and loaning rates are easy. In the iron trade mills are crowded with orders, and prices of pig iron and rolling mill products are strong. Little change is noted in metals. Copper is easier, with buyers and sellers holding off, and lead and tin plate are rather weak under a very restricted demand. Speculation in securities has been narrow. The stock market is wholly in "professional" hands and investment business almost an absent quantity.

Natural Gas Consumption.

The United States Geological Survey has compiled and lately published some interesting figures in regard to the consumption of natural gas in the United States, which show that the amount of natural gas produced in this country is steadily declining. This is not attributed to lack of demand, but to a natural exhaustion of the supply. From a value of $22,600,000 in 1888, the quantity of natural gas used has steadily dropped, until last year it amounted to only $13,000,000 in value. These figures, however, do not adequately reflect the actual decline, as prices of the product were much lower prior to 1894 than they are now. Moreover, in the earlier days much of the gas was lost by leakage and careless management. Of late a closer watch has been kept on the condition of the pipe lines, and leaks which were neglected in former years are avoided, while methods for consuming the gas economically have been generally introduced. Of the quantity of natural gas used in 1896, Pennsylvania and Indiana furnished more than two-thirds, each State producing over $5,000,000 worth. In 1888 the Pennsylvania output was valued at $19,280,000, while Indiana's was only $1,320,000. Ohio, which stands third on the list of natural gas States, produced to the value of $1,500,000 in 1888 and $1,172,000 in 1896. West Virginia, the fourth on the list, is credited with producing $100,000 worth of natural gas in 1888 and $640,000 last year.

The proposal to erect a colossal statue of Tubal Cain near Pittsburgh appears to be something more than a newspaper *canard*. The matter, it is announced, has been taken up officially by the Engineers' Society of Western Pennsylvania and the local Foundrymen's Association, and the site for the suggested monument is reported to have been selected, in the Ohio River at the confluence of the Allegheny and Monongahela rivers. It is proposed to build the pedestal of the statue—which will rise from the water—of iron and steel and to place upon it a colossal bronze figure representing the Father of Metal Workers. No more suitable spot could be chosen in which to honor the memory of the tutelary genius of the great industry which has made the Pittsburgh region famous and wealthy. The position of the statue would be such that it would be viewed by all visitors approaching the Iron City.

The lightest known solid is said to be the pith of the sunflower, with a specific gravity of 0.028, or about one-eighth that of cork. The sunflower is extensively cultivated in Central Russia, and various uses are served by its different parts, the recent discovery of the lightness of the pith essentially increasing the commercial value of the plant. For life saving appliances cork has a buoyancy of 1 to 5, while with the sunflower pith 1 to 35 is obtained. About 800 cubic inches of it would weigh as much as 1 cubic inch of iridium, the heaviest metal.

THE LETTER BOX.

Removing Lime from Water Back.

From Plumber, Allentown, Pa.—The water in our town is of such a nature that a water back used with the ordinary kitchen stove will soon be filled with a deposit which destroys its usefulness and makes it necessary to replace the water back. I have accumulated a large number of these water backs and would like to know if there is any way in which the deposit can be removed readily. The water backs are as good as new, with the exception of the deposits, and are for stoves that are used in this vicinity, so that there would be a ready sale for them if they were cleaned out.

Note.—We shall be glad to hear from the trade in reference to this subject. In previous communications that have appeared in *The Metal Worker* it has been stated that common washing soda placed in a kitchen boiler and left under a mild firing for from one to three days will so soften the lime deposit that the circulation of the water between the water back and the boiler will wash the deposit into the boiler, where, by opening the sediment cock, the soda and dissolved accumulation may be run off. It is a well-known fact that washing soda is frequently used in steam boilers to remove the scale from the surface. With this information before us it seems reasonable that if the water backs in question were immersed in a large vessel filled with a strong solution of soda and water, and the water was kept at a temperature approaching the boiling point for several hours, the deposit would be sufficiently softened to be readily washed out. The experiment is simple, and in case there are a large number of water backs might be worth the trial.

Pattern for a "Y."

From S. S. R., Cambridge, Mass.—Please inform me through *The Metal Worker* how to draw a pattern for joining two pipes together as I show in the sketch, the main pipe to be 20 inches in diameter and reducing to two 10-inch pipes.

Note.—If our correspondent will consult Problem 207, Page 309, in "The New Metal Worker Pattern Book" he will find how to cut a pattern for a Y consisting of two tapering pipes joining a larger pipe at any angle, which we believe is exactly the problem he has in mind.

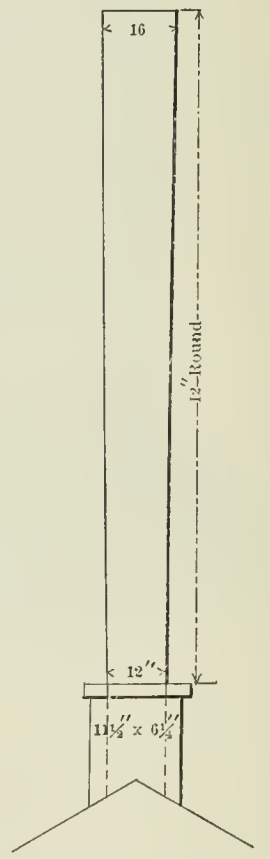
Freezing a Service Pipe.

From H. A., Philadelphia.—I have some work to do on a system where there are no means of shutting off the water supplied to a building, and would like to know if it is safe to stop the water by freezing the service pipe.

Answer.—If the service pipe is made of lead there is very little danger of bursting the pipe by freezing it when there is a chance for the water in the pipe to expand in both directions from the point where it is frozen. The work of freezing the pipe is comparatively simple, as are also the appliances that will be needed for doing it. The pipe can be frozen in from half an hour to an hour, depending upon its size and whether or not the water is running at the time freezing is attempted. If it is an ordinary pipe of ½ to ¾ inch diameter there will be very little difficulty. To freeze the pipe it is necessary to surround it with a mixture of ice and salt, and a simple and good way to keep this material in contact with this pipe would be to secure a small box of about 16 inches in length, 12 or 14 inches in width and about 12 inches deep. Saw notches in each end of the box about one-half of the depth of the box, and of sufficient width to slip over the pipe. The box should then be moistened with water and made water tight by being daubed with clay. The box should be placed in position around the pipe and firmly supported. The notches should be made water tight with the clay. Then by breaking the ice into quite small pieces, smaller than chestnut coal, and mixing with it a liberal sprinkling of coarse salt, such as is used in manufacturing ice cream, and filling the box with this, the freezing is only a question of time. It is a simple matter to tell when the pipe is sufficiently frozen to work by driving a small nail into the pipe to see if water comes out. If it still leaks water, the opening should be closed and more time given for the freezing mixture to act.

A Chimney Difficulty.

From H. W. Gazlay, Cortland, N. Y.—In answer to the inquiry of "J. K.," in reference to a chimney difficulty, which appeared in *The Metal Worker* of September



A Chimney Difficulty

25, you say the area of the chimney is 76 square inches, and I find that four openings for 6-inch pipes have the combined area of 112 square inches. It would appear that the difficulty is right here. The capacity of the chimney is too small for four 6-inch pipes. The proper thing to do is to build a chimney of sufficient capacity. I think the best way to assist the chimney is shown by the sketch herewith, using a tapering stack 12 feet high, 12 inches in diameter at the base and 16 inches in diameter at the top.

Pattern for a Lamp.

From W. E. B., Panther, Iowa.—I wish some reader of *The Metal Worker* would furnish a design and directions for cutting the patterns for a locomotive water gauge lamp, the body to be of Russia iron and trimmed with brass.

SHEET METAL WORK.

MAKING SQUARE PIPE.

BY PRACTICAL.

As the making of square pipe to be used as stacks for conveying hot air to upper rooms is considered by many a rather difficult job, the following description of a rapid and convenient method may be of interest to some of your readers. Provide bench at least 30 inches wide and 10 or 12 feet long, with iron strip 2 x ¼ inch let in flush with top and front edge. Strip to be straight on front

Making Square Pipe —Fig. 1.—Marking Out the Work.

edge, and fastened to bench with ¼-inch countersunk head bolts 2 feet apart. Also provide iron or steel bar 2 x 2 inches square and 12 feet long. Also two horses for supporting the same at a hight level with the top of bench. Then proceed as follows for making 3½ x 10 pipe.

Use 20 x 28 tin. Full weight IC answers every purpose for this size. Groove or double lock together (double lock is decidedly preferable) four sheets the 28-inch way,

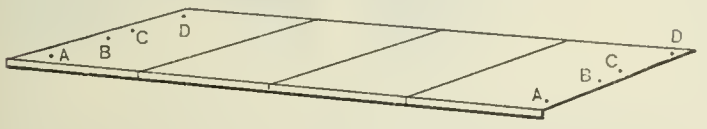


Fig. 2.—Turning the Edge

making what we will call a "strip" 28 inches wide and about 76 inches long. (From now on this method will require man and helper.) Lay strip on bench and with straight edge long enough to reach whole length of strip mark and trim one edge straight. At each end of strip prick mark as follows: From edge 3¾ inches, from this 10 inches, from this 3½, from this 10½, as indicated by AA, BB, CC and DD of Fig. 1.

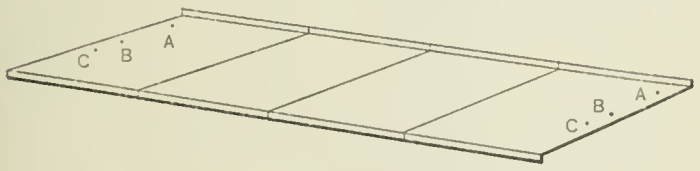


Fig. 3.—Turning the Edge on the Other Side.

Bring edge of strip ¼ inch over edge of bench and with mallet turn down square and smooth as in Fig. 2. Turn strip over. Mark and trim to marks DD. Bring over bench ¼ inch and turn down again as in Fig. 3. Turn strip over lengthwise so that the edge last turned will stand up at edge of bench. With mallet drive this edge over flat on some thin piece of iron (see Fig. 4), like a pipe gauge or rule, Fig. 4. Turn strip over so opposite edge will stand up at edge of bench and bring strip over edge of bench to marks AA and brake down square as in Fig. 5. Rub corner square and smooth with corner of mallet as shown in Fig. 6. Bring strip out to marks BB and brake again as in Fig. 7. Now remove the strip to bar and brake at marks CC. Turn the pipe thus formed so edge turned flat will hook over edge turned square as in Fig. 8. At this point see that pipe is not winding by sliding the edges one way or the other and then double seam the corner and you have a length of pipe completed 76 inches long. It will be noticed that one end of the

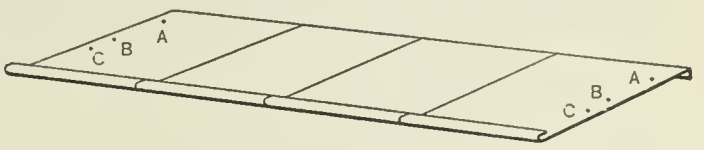


Fig. 4.—Edge Flattened Down.

bar extends over one horse far enough to enable one man to tip up the other end far enough to allow the other man to slide the pipe off the bar.

The above description applies to the making of any size pipe that can be made entire from the length of one sheet. When a size of pipe is required that one sheet will not make entire a little different method must be employed. Suppose a pipe 3½ x 11½ inches is required. A strip 28 inches wide made as described above will make three sides of this pipe, as follows: Square one edge and prick mark from edge 12 inches, from this 3½ inches, from

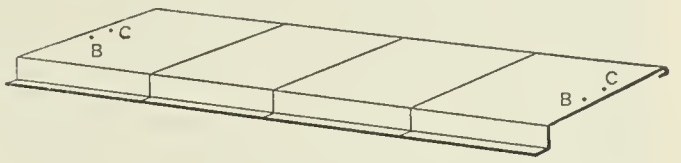


Fig. 5.—Making the First Bend of the Pipe.

this 12 inches. Square the other edge at last mark and turn both edges over flat and both the same way. Turn strip over so edges will be down. Brake square at first marks. Remove to bar and brake at remaining mark, and you have three sides of required pipe. For the other side groove together strip 4 inches wide and of the length of the pipe. Before grooving together turn with folder on both sides and both the same way a ¼-inch edge up square and lay the strip on the bar with the edges up Hook the edges of the unfinished pipe over the edges of the strip and double seam the corners and the pipe is finished.

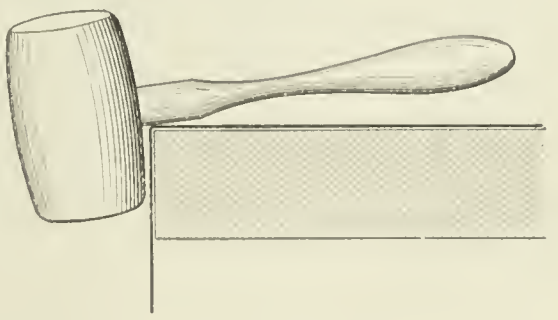


Fig. 6.—Using the Mallet to Finish the Bend.

This method will cover any size of pipe that the length of one sheet will make three sides of the pipe. If a 5 x 12 inch pipe is required, 9-inch pipe stock, which is 29½ inches, will make three sides of a 4¾ x 12 pipe, which will always answer. If a 6 x 12 pipe is required groove together three sheets of 20 x 28 tin the 20-inch way, making a strip 20 inches wide and 83 inches long. Square and trim

one edge and mark from edge 6¼ inches, and from this 12½ inches. Turn edge down square. Turn strip over and turn this edge over flat and opposite the other. Brake at remaining mark so that edge turned flat will be inside and you have two sides of the pipe. Take two such pieces to the bar and double seam the corners that match and the pipe is finished. It will thus be seen that these three methods will cover any size pipe that may be required, which can be made from the regular size tin with small waste, if any, and with a little practice will be found to be made rapidly. Furthermore, they are a convenient length to handle and two of them will make a stack.

There are several ways of connecting the lengths together, but I think the best way is as follows : From the scrap tin cut strips 2 inches wide, then with folder turn narrow edge on both sides and the same way and press flat. From these cut pieces in lengths to correspond with the widths of the four sides of the pipe, which strips we

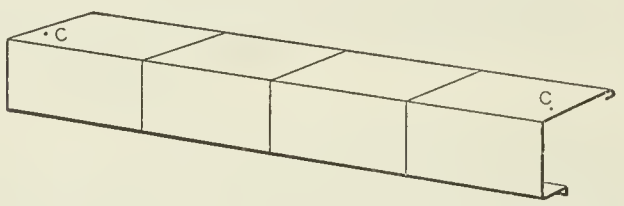


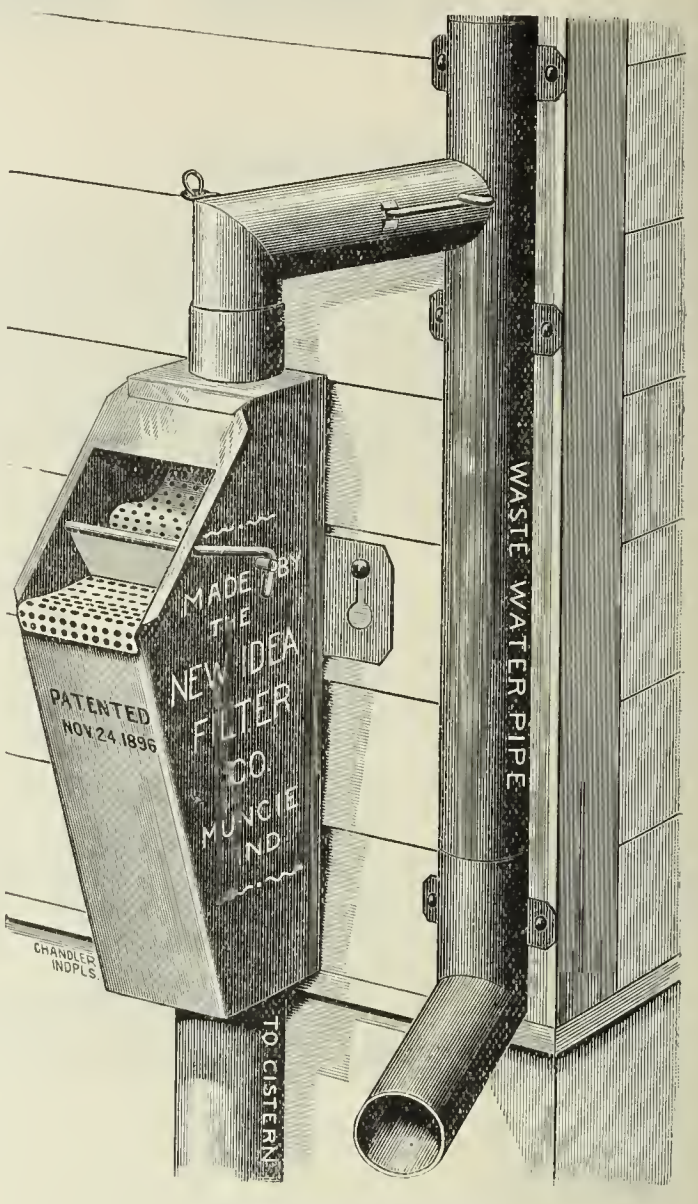
Fig. 7.—Making the Second Bend.

will designate as wings. Cut a V-shaped notch about 1 inch deep in each corner of one end of the pipe and rivet on the wings, using three rivets for the long ones and two for the short ones. Before riveting see that the wings are about ¼ inch from the end of the pipe. Have the rivets close to the lower edge of wing and below the notch in the pipe. When two lengths of pipe are to be put together the notches in the corner of the pipe will allow the pipe to be pressed in sufficiently to allow the end of the other length to slide over and between the pipe and wing, after which it may be soldered if desired, making a tight and strong connection. One end of each length should be provided with wings; the fittings also, such as elbows, tees, offsets, &c., should have these wings on one end for connecting to the pipe when required.

The new rolling mill company who are the outgrowth of the strike at the Scottdale Iron & Steel Company's plants were organized at Scottdale, Pa., this week. The capital of $125,000 has all been raised, and the first assessment of 20 per cent. has been paid in. The Board of Directors consists of A. L. Keiser, J. W. Ruth, A. C. Overholt, J. S. Parker, M. A. McCombs, P. F. McCann and James A. Bennett. All of the directors are from Scottdale and Greensburg. A. B. Pickard, cashier of the First National Bank of Scottdale, has been elected treasurer of the new company. The directors will meet and elect officers at an early date, as it is desired to begin work on the new plant as soon as possible.

The New Idea Rain Water Filter.

In the accompanying illustration we show the New Idea rain water filter, put on the market by the New Idea Filter Company of Muncie, Ind. This filter is designed



The New Idea Rain Water Filter.

for use in connection with a rain water conductor to filter the water and prevent dust and other refuse that accumulates on the roof in dry weather from being carried into the cistern in case of rain. In use a rain water cut off should be provided in the conductor pipe, one end connecting with a filter and the other connecting with an open elbow for the discharge on the surface of the ground. The construction of the filter is such as to permit the water to run into it freely, and any dirt that may be carried into it is collected on a perforated grating without making a splashing or overflowing. A gate is provided that is automatic in its operation, preventing the overflow of water and raising on the accumulation of leaves or other matter, so as to permit its discharge by the force of the

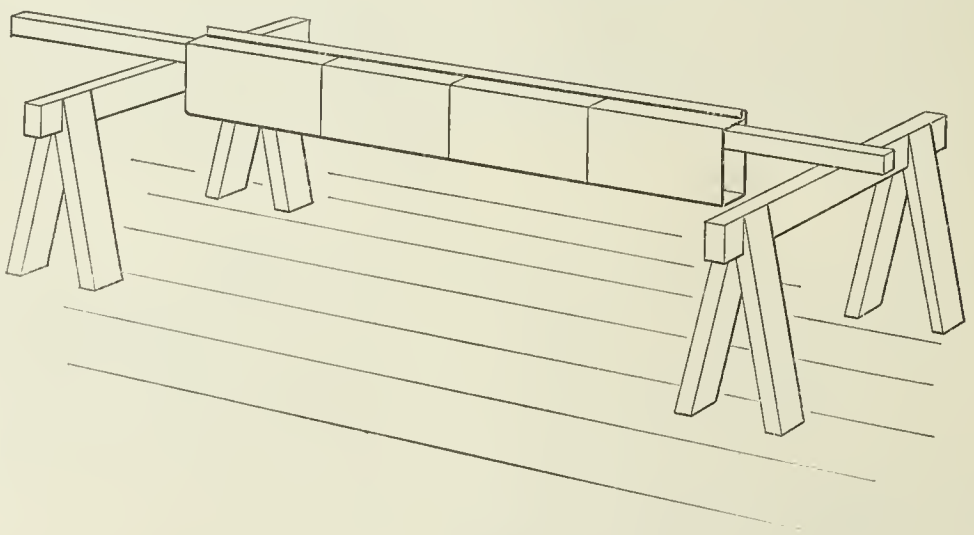
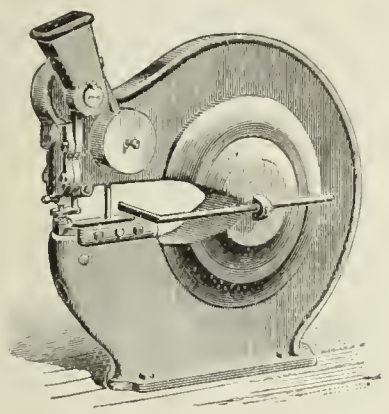


Fig. 8.—Finishing the Pipe.

water. After the water has passed through the first grating it is again filtered by passing through a finely perforated cylindrical pipe or tube, the top of which is high enough to prevent the overflow of refuse into the cistern, an outlet for the overflow being provided through the perforated plate shown in the cut. The filters are made for 3, 4 and 5 inch conductors, and have been used with satisfaction by a number of persons, as attested by testimonial letters from them presented in the circulars of the company.

General Purpose Punch.

The accompanying illustration shows in its improved form the general purpose lever punch made by Bertsch & Co., Cambridge City, Ind. These punches, which are made in five sizes and adapted to power if desired, are for sheet iron workers, boiler makers, railing makers, carriage shops, wagon shops, &c. They will punch holes near the edge of angle and flange iron or around the edge of a 5-inch pipe or ring, the lever working from front or back. The eccentric is steel, likewise the plunger, eccentric yoke and box. There are three sets of quick adjusting dies and punches, and back and side gauges for punching holes equal distances apart without marking off. A mark on the work can be easily seen, as the stripper or take off is placed behind the plunger and is so arranged that it affords all the light possible. These tools, it is stated, will easily punch a ½-inch hole in ⅜ iron, as the eccentric has a short movement which makes a very powerful punch. The machine is now made with the punch plunger bearing and die seat adjustable, these features, it is pointed out, adding much to the life of the machine and decreasing the liability of chipping and breaking punches. Any lost motion in the plunger bearing can be easily taken up and the die seat adjusted so the punch will always enter the die centrally. The machines are made with from 4 to 24 inch throat for light or heavy work and special sizes for punching ½-inch holes in ½-inch iron.



General Purpose Punch

Aluminum for Packing Purposes.

In his comprehensive paper on "The Utilization of Aluminum in the Arts," recently read before the Franklin Institute of Philadelphia, President Alfred E. Hunt of the Pittsburgh Reduction Company remarked as follows regarding the use of this metal for the purpose of packing food products, a field in which aluminum seems to have a promising future :

In the great continental scourges that have played such havoc in far away parts of the world during the past year—the rinderpest in Africa, the famine and plague in India, as well as in the war between China and Japan—aluminum has played an important alleviating part in the form of metallic covers or cases for compressed foods hermetically sealed in oil paper packages. These cases not only form serviceable light covers to protect the food and allow of its rapid distribution in the afflicted districts, but also serve as convenient dishes in which to heat and cook the food at the time of its consumption.

A novel use for aluminum, which is likely to become quite a large one, is in tea caddies or boxes for the shipment of tea from the far away countries of China, India, Japan and Ceylon, where the tea is grown. The common practice now is to ship tea in wooden boxes, lead lined and sealed in specially prepared paper. Tea boxes are now being made of thin aluminum sheets about 5-100 inch in thickness, weighing about seven-tenths of a pound to the square foot, the sheets being riveted together in water tight boxes of the metal, with angles at the inside corners for holding the riveted joints together. The aluminum sheets are given a satin finish on the outside to allow the special printing and marking of the boxes as desired by the tea merchants. These aluminum tea boxes are lighter and cost but little more than lead lined wooden boxes that have heretofore been used.

American versus English Hoops.

Some interesting comparative tests of American and English hoop iron were recently conducted in behalf of a consumer in South America. The results of the tensile tests are shown in the following table:

	Standing strain. Pounds, English.	Elongation.
English hoop, 1 single piece of.....0.605m.	2,884	0 015
N. American hoop, 1 single piece of.....0.605m.	4.032	0.020
English hoop, 2 pieces with rivet.....0.605m.	2,724	0.010
N. American hoop, 2 pieces with rivet.....0.605m.	3.416	0.015
English hoop, 2 pieces with 2 rivets.....0.69m.	2,836	0.015
N. American hoop, 2 pieces with 2 rivets..0.605m.	3,668	0 035

The ends of the pieces had to be bent to get them into the machine, with the result that the English hoop broke, whereas the American hoop bent without breaking ; moreover, the English hoop gave away at the ends, the American hoop in the middle and at the rivets.

The following are recent tests of American hoops, also made by a consumer who uses them abroad:

Breadth.	Thickness.	Tension in pounds. Maximum.	Tension in pounds to square inch.	Elongation in inches.	Percentage of elongation.
1 31/64	0.076	8,300	73,500	24/16	25 0
1 31/64	0.078	8,400	72,500	20/16	20.8
1 31/64	0.076	8,300	73,500	23/16	23.9
1 31/64	0 076	8 200	72,600	16/16	16.6
1 49/64	0.076	10,400	77,500	22/16	22.9
1 48/64	0.077	10,500	77,900	25/16	26.0
1 49/64	0.077	10,400	76.4 0	15/16	15.6
1 49/64	0.077	9,500	69,800	20/16	20.8

These hoops were made and shipped by A. R. Whitney & Co.

Electrolytic Corrosion of Water Pipes.

The following report concerning the electrolytic corrosion of water pipes, &c., caused by the current from the electric railways was made by E. B. Ellicott, superintendent of the City Telegraph Department of Chicago:

I have had an examination made of the ground return of the street railway company operating an electric railway line on South State street, with the following result: At the corner of Fifty-first and State streets a test was made between a 30 inch gas pipe and the rails of the street railway company. It showed there was a current of 25 amperes flowing from the pipes to the rails at a point where this large main was intersected with a 7-inch gas pipe at Fifty-first street. In the block between Fiftieth and Fifty-first streets there was found to be a difference of potential of three volts between the hydrant and the rails and a current flow of 16 to 20 amperes. Between Fifty-first and Fifty-second streets, near which latter street is located the power house of the street railway company, there is a gradual decrease in current flow, which shows that the ground return at a point on Fifty-first street and State street is very poor.

The railway company should be required to run the proper return wires from this point in order to decrease the flow of current from the pipe to the rails. The 6-inch gas pipe which was removed was found to be very badly pitted from the action of the current, and it is no doubt affecting the water mains in this vicinity and at other points along the line which have not as yet been tested.

The difference of potential between the rails and the gas and water pipes should be reduced to practically nothing in order to prevent the deterioration of the pipes. I do not know of any other way of securing this result, except to run the proper sized copper return cables and make connections to the rails at such points that it will prevent the flow of current between the pipes and the rails, or to connect the pipes to the rails at different points along the line and give the current a path to the rails through a good connection.

I would not want to recommend this latter method without first making some very careful and extended tests. There is no doubt that within the next year or two it will be necessary to replace many of the water mains, owing to their being affected by carrying the street railway return current, and I am of the opinion that a complete test should be made of all the street railway lines which parallel water mains with a view of determining where the dangerous points are, and that the railway companies be required to remedy the defects in the return conductors.

I would suggest that a competent man be detailed for this work and the tests be made at an early date in order that the railway companies may have an opportunity to correct the defects before winter. The test above referred to was made with a representative of the South Chicago City Railway Company present, and their reports will probably show the same results as above given.

HEATING AND PLUMBING.

Plumbing Ordinance of Peoria, Ill.

We conclude this week the publication of the plumbing ordinance of Peoria, Ill., commenced in our last issue :

ARTICLE III.

Section 1. That the construction, maintenance and control of the plumbing, drainage and ventilation of all buildings in the city of Peoria, Ill., shall hereafter conform to and comply with the following rules and regulations—viz.:

PLANS OF PLUMBING.

Sec. 2. Before the construction, reconstruction, alteration or repair of any portion of the plumbing and drainage system of any building where the amount will exceed $50, suitable plans, specifications and descriptions of all work proposed to be done shall be presented to the Plumbing Inspector by the architect or by the owner or agent of the property. Such plans, specifications and descriptions, after examination, shall be marked "approved" or "rejected" and returned to the owner.

Sec. 3. All plumbing plans and sections shall be drawn to scale and shall show clearly the location of every pipe, fixture and trap, and the ventilation of rooms in which plumbing fixtures are to be placed. Plans must be drawn in ink on heavy paper or on tracing cloth 8 x 12¼ inches or 16 x 12¼ inches in size.

Sec. 4. One vertical drawing is sufficient for a building when it can be made to show all the work ; if not, others must be submitted. Where a number of buildings are situated together on one street, and the plumbing is the same in each, one plan will be permitted for all the buildings. In such a case a general plan must be submitted, showing all the houses and the location of the main drain for each house. Every plan must be accompanied by a clear, written description thereof, or abstract of the specifications.

Sec. 5. Plans and specifications will be approved or rejected within a reasonable time from the date of filing. In case of disapproval the person filing the plan will be notified in writing of the reasons for such disapproval.

Sec. 6. No portion of the plumbing or drainage work on any building shall be executed until the above mentioned plans and descriptions thereof shall have been approved by the Plumbing Inspector.

Sec. 7. These regulations shall also apply to any extensions or alterations of existing systems. In such cases a plan of the old system, together with a plan of the proposed changes, must be filed in the office of the Plumbing Inspector.

Sec. 8. All approved plans, drawings, specifications or descriptions shall be permanently marked "approved," and signed by the Plumbing Inspector. The said inspector shall also issue a certificate of approval, which shall be made in book form, well bound and numbered in duplicate from one upward. These duplicates shall be signed by the Plumbing Inspector, one of which shall be delivered to the person, firm or corporation filing the plans, specifications and descriptions, and the other to remain undetached in said book in the office of the inspector, to be retained for any future use or reference by the city.

Sec. 9. If the work is not begun under the approved plans within six months from the date of approval, such plans must be again presented for approval. Plans are approved under condition that such approval expires by its own limitation within six months from the date of approval ; and where one plan has been submitted for more than one building, this rule shall apply as to each of said buildings as if said plan had been filed for such building only.

Sec. 10. No change or modification of the approved plans will be permitted unless such change or modification be authorized by the owner or agents, submitted to the Plumbing Inspector, and approved and placed on file as in the case of original work.

Sec. 11. The Plumbing Inspector shall keep in suitable form a record of all plans and specifications examined by him, whether approved or rejected, and whether for new buildings or of old system inspected and examined by him, and shall as soon as possible complete the record of the plumbing or want of plumbing, sewer connections, &c., in each building in the city, with such explanations and notes appended thereto as will enable future boards or inspectors to trace sources of filth and causes of sickness, enforce the best sanitary conditions, and to preserve the public health without re-examination or inspection of plumbing, drainage and ventilation.

OLD PLUMBING.

Sec. 12. Whenever it shall come to the knowledge of the inspector, or complaint in writing shall be made by two citizens, that the plumbing in any building causes a nuisance, or is contrary to the ordinances of said city, or is of faulty construction and liable to breed sickness or disease, or endanger the health of the occupants ; or upon the request of any owner or occupant of any building fitted with plumbing prior to the passage of this ordinance, to the Commissioner of Health, then said Board of Health shall direct the Plumbing Inspector to examine the plumbing in any such building, and such inspector shall make a drawing of the plans of said plumbing, drainage and sewer and ventilating shaft connections. He shall report his findings in writing to the Board of Health and suggest such changes as are necessary to make the same conform to the rules governing these matters. The Board of Health shall then notify the owner or owners, agent or occupant of any such building of the changes which are necessary to be made in the plumbing. These changes shall be made within a time fixed by said board, and upon a refusal or neglect to obey such orders the board shall proceed to have such changes made and such nuisance abated and recover the expense from the owner or occupant of said premises.

INSPECTION WORK.

Sec. 13. The Plumbing Inspector must be notified when the work is begun and when any work is ready for inspection by the plumber doing the work. All work must be left uncovered and convenient for examination until inspected and approved. No notice shall be sent for an inspection until work is entirely ready for thorough inspection. In case of any violation of this regulation, the approval of said plans may be at once revoked by the Plumbing Inspector, and upon notice of revocation being given all work on said plans must cease.

Sec. 14. The Plumbing Inspector will examine the work within two working days after notice that it is ready for inspection has been received. All plumbing when placed in position must be tested by the water test in the presence of the Plumbing Inspector, and all defective joints made tight. Defective pipe must be removed and replaced with sound pipe. When the entire plumbing work is completed, and before it is used, it must be tested by peppermint, or other practical test, in the presence of the Plumbing Inspector, and upon satisfactory completion of said work the Plumbing Inspector shall issue a certificate of approval.

HOUSE DRAINS.

Sec. 15. All soil, waste and vent pipes shall be of cast iron, galvanized wrought iron, lead or brass. No brick, earthenware or sheet metal pipe shall be used in any part of the plumbing or drainage system within a building or for ventilation pipes ; chimney flues shall not be used for ventilators. All cast iron pipes shall be thoroughly coated, inside and out, with coal tar or pitch, applied hot by immersion. Such pipe shall be of uniform thickness, free from holes, cracks or other defects, and shall have an average weight of not less than specified below :

2-inch pipe, 5½ pounds per lineal foot.
3-inch pipe, 9½ pounds per lineal foot.
4-inch pipe, 13 pounds per lineal foot.
5-inch pipe, 17 pounds per lineal foot.
6-inch pipe, 20 pounds per lineal foot.
7-inch pipe, 27 pounds per lineal foot.
8-inch pipe, 33½ pounds per lineal foot.

Sec. 16. All fittings used in connection with cast iron pipe shall be of corresponding weight and quality ; fittings for galvanized wrought iron pipe to be of galvanized malleable iron.

Sec. 17. When lead pipe is used for waste or vent pipes it shall have a weight of not less than specified as follows :

1-inch pipe, 2 pounds per lineal foot.
1¼-inch pipe, 2½ pounds per lineal foot.
1½-inch pipe, 3½ pounds per lineal foot.
2-inch pipe, 4 pounds per lineal foot.
3-inch pipe, 5 pounds per lineal foot.
3½-inch pipe, 6½ pounds per lineal foot.
4-inch pipe, 8 pounds per lineal foot.

Where lead pipe is used to connect fixtures with soil

or waste pipes, or to connect traps with vent pipes, such branches shall be as short as possible. All wrought iron pipes shall be galvanized, of standard weight, and shall be lap or butt welded with screw joints.

Sec. 18. All joints in cast iron pipes, drain pipes, soil pipes and waste pipes shall be so filled with oakum and lead, and hand calked, as to make them gas and water tight. Wrought iron pipes shall be connected by means of proper couplings with screw joints, cemented with red lead All connections between lead and cast iron pipes shall be made with suitable brass or lead furrules of the same size as the lead pipe, put in the hub of the branch of cast iron pipe and calked with lead, the lead pipe to be attached to the ferrule by means of a wipe joint.

Sec. 19. Wrought iron pipes shall be connected with lead pipes by means of a brass soldering nipple wiped to the lead pipe. All connections of lead, waste and vent pipes shall be made by means of wipe joints. Where wrought iron pipe is connected with cast iron pipes the cast iron fitting must be tapped and the connection made by a screw joint.

Sec. 20. All drain, soil, waste, vent and supply pipes shall be as direct and concentrated as possible, protected from frost and readily accessible for inspection and convenience in repairing. When necessarily placed within partitions or recesses in walls, soil and waste pipes must never be covered except with wood work, said wood work to be fastened with screws (never nails) so as to be readily removed.

Sec. 21. The least diameter of soil or drain pipe permitted is 4 inches. A vertical waste pipe into which a line of kitchen sinks discharges shall be at least 2 inches in diameter, if receiving the waste of five or more sinks, and shall have 2 inch branches.

Sec. 22. All changes in direction of cast or wrought iron pipes shall be made with curved fittings ; all connections shall be made with Y branches and one-sixteenth or one-eighth bends, if possible, and sanitary tees.

Sec. 23. Every vertical soil, vent and main waste pipe shall extend at least 2 feet above the highest part of the roof or coping, except in the case of flat roof tenement houses, in which it shall extend at least 6 feet above the roof, and said pipe shall have a diameter above the roof at least 1 inch greater than the pipe proper, but in no case shall it be less than 4 inches in diameter above the roof. No cap or cowl shall be affixed to the top of such ventilation pipe, but a strong wire basket shall be provided and securely fastened thereto. Each length shall be securely fastened, and in case of each line of soil pipe it shall rest at its foot upon a pier or a foundation to prevent settling.

Sec. 24. Whenever the roof of a building in which soil or ventilation pipes are being placed is found to be below the one adjoining it, these pipes must be extended 1 foot above the highest roof, according to direction of the Plumbing Inspector.

VENTILATION.

Sec. 25. If soil or waste pipes are placed in buildings for future use, the necessary ventilation pipes shall also be put in and the work tested and inspected as if for immediate use. All openings not in use shall be closed by plugs screwed or calked in.

Sec. 26. The house drains within the building shall be securely hung on the cellar walls or the cellar ceiling, unless this is impracticable, in which case they must be laid in an open trench with a fall of at least ¼ inch to the foot, and more, if possible. The drain shall not be buried in the cellar bottom, except by special permission of the Plumbing Inspector. The main drain shall be provided with openings for cleaning purposes, the same to be closed by brass screw plugs.

Sec. 27. Overflow pipes from traps must in each case be connected on the inlet side of the trap to the same fixture. The overflow pipes from tanks and waste pipes from refrigerators or other receptacles in which provisions are stored shall be properly trapped, and shall discharge into an open water supply fixture.

Sec. 28. All vertical lines of soil pipes must have a clean out at the foot of the line. Where the direction of soil pipe or waste pipe is changed, clean out connections must be placed ; also at the end of each horizontal line and each junction. All clean outs shall be of the same diameter as of the pipe into which it is inserted, and be of heavy cast brass at least 4 inches long with air tight screw joints. All clean outs shall be calked into the iron pipe with molten lead and picked oakum.

Sec. 29. All openings in soil, sewer, drain, waste, supply and ventilation pipes must be closed by plugs, screwed, calked or wiped in.

Trap screws must be placed on the ends of all lines of waste pipe having more than one fixture attached to it on the same floor, and on the end of all horizontal lines.

TRAPS.

Sec. 30. Every water closet, urinal, sink, basin, wash tray, tub or set of tubs and hydrant waste pipes, and all other fixtures, shall be separately and effectively trapped. Urinal platforms, if connected to drain pipes, shall also be properly trapped, and a supply of water so arranged as to always maintain the seal of said traps. In no case shall the waste from the bathtub or other fixture be connected with a water closet trap. Traps shall be placed as near the fixtures as practicable, and in no case shall a trap be more than 2 feet from the fixture ; each and every trap shall be provided with suitable accessible openings for cleaning purposes.

Sec. 31. There shall be no trap placed on vertical soil and waste pipes. Traps must be protected from siphonage and the waste pipe leading from them ventilated by a special air pipe, in no case less than 2 inches in diameter for water closet traps and 1½ inches for other traps.

Sec. 32. These vent pipes must open into a vertical ventilating pipe at least 3 inches in diameter, increasing in area as it passes upward to correspond with the combined area of all branch vents passing into it, and extending above the roof, as herein provided ; or they may open into the soil pipe extension above all fixtures.

Sec. 33. Slop sinks, kitchen sinks and pantry sinks in all restaurants, hotels, eating houses and boarding houses must be provided with and connected to a grease trap or catch basin of approved pattern.

WATER CLOSET.

Sec. 34. No water closet shall be supplied directly from the house supply pipe, but shall be supplied with water from a special tank or cistern not used for any other purpose, and shall in all cases be separately and independently connected with the general or common drain pipe of the house. The flooding pipe shall not be less than 1¼ inches in diameter.

Sec. 35. All water closets shall be located in a well ventilated apartment, with a window of suitable dimensions leading directly to the outer air. The space in and around the water closets and wash bowls shall not be inclosed by wood work, but shall remain open and exposed to view. A group of closets may be supplied from one tank, but water closets of different floors shall not be flushed with water from one tank.

Sec. 36. All joints between the water closet and soil pipe shall be made by means of brass connections, properly soldered to lead soil pipe and united to closet by a rubber gasket. No saddle hubs shall be used. A proper floor flange of brass, at least ¼ inch thick, and securely soldered to lead bend, shall be used in setting water closets, and rubber gasket with two or more ribs extending above it placed between the flange and closet. Cast iron traps shall have lead calked joints.

Sec. 37. No pan or plunger closet shall hereafter be placed in any building, nor shall any old pan of plunger closet be replaced by a new one, nor shall any hopper closet be placed in any building except in case of an outside water closet.

Sec. 38. In tenement houses there shall be a separate water closet for each family. One outside water closet shall not be used by more than two families. In no case will a water closet be allowed in the cellar or basement of a building without a special permit from the Board of Health.

CELLARS.

Sec. 39. Where pipes pass under the walls of a house there shall be a relieving arch to prevent the pipe being broken by the settling of masonry. Cellars shall be drained by means of suitable, properly laid earthenware tile pipes. A running trap or trapped basin shall separate the cellar drain from the house drain or sewer. Cellar and foundation walls shall be rendered impervious to dampness, and sub-soil drains must be provided when necessary.

Cellars and areas shall not be connected with the house drain unless absolutely necessary. If connected with the house drain, they must be properly trapped and water supply sufficient provided to maintain the seal at all times.

RAIN WATER LEADERS.

Sec. 40. Rain water leaders will be allowed connected to the house sewer only when special permission is obtained from the Plumbing Inspector. When within the house, the rain water leader must be of cast iron with leaded joints or galvanized wrought iron. The rain water leaders shall never be used as soil pipe, waste pipe or vent pipe, nor shall any soil, waste or vent pipe be used as a leader. When outside of a house, and connected with the house drain, it must, if of sheet metal, with slip joints, be trapped beneath the ground or just inside the wall, the trap being protected from frost.

Sec. 41. In every case where a leader opens near a window or a light shaft it must be properly trapped at its base. The joint between an iron leader and the roof must be made gas and water tight, preferably by means of a brass ferrule and lead or copper pipe properly soldered.

STEAM PIPES.

Sec. 42. No steam exhaust or blow off pipe shall be connected with any private drain or sewer which is connected with any public drain or sewer. Such pipes shall

discharge into a tank or condenser, approved by the City Engineer, the waste from which, if discharged into the sewer through the house drain, shall be connected on the sewer side of the running trap.

Sec. 43. That the provisions and regulations contained in the foregoing rules, together with such instruction as the Plumbing Inspector may deem proper, shall extend over and govern the construction. reconstruction, maintenance, alterations and repairs of plumbing, drainage and ventilation of all buildings in the city of Peoria, and to a point 4 feet outside of the walls of the same.

Sec. 44. Any person, persons, firm or corporation who shall violate any one of the provisions of this ordinance, or who shall fail or neglect to comply with any of the foregoing rules and regulations, or who shall fail or neglect to comply with any of said provisions, rules, orders or regulations in this ordinance contained, shall be guilty of a misdemeanor and on conviction thereof shall be fined in any sum not exceeding $100 for each offense, and if the guilty party be a licensed plumber the Mayor of the city of Peoria, on written notice thereof, shall revoke such license.

ARTICLE IV.—PLUMBERS' LICENSE—PENALTY.

Section 1. No person, firm or corporation shall carry on the business of plumbing within said city of Peoria without having first obtained a license therefor, under a penalty of not less than $20, nor more than $200 for each offense.

LICENSE FEE.

Sec. 2. Licenses shall be granted to practical plumbers holding a certificate issued by a duly qualified Board of Examiners within the State of Illinois, upon the payment of $10 per annum.

APPLICATION FOR LICENSE.

Sec. 3. Application for license shall be made in writing to the Mayor. It shall state the full name of the applicant, his place of residence, his existing or proposed place of business, and the firm name under which the business is to be carried on, and the name of each member of any firm.

BOND—CONDIT ON.

Sec. 4. Before any license shall be granted to any person to carry on the business of plumbing he shall execute a bond to the city of Peoria, with two or more sureties, to be approved by the Mayor, in the sum of $5000, conditioned that he will indemnify and save harmless the city of Peoria from all accidents or indemnities caused by any negligence in either the execution or protection of his work, or from any unfaithful or inadequate work done under or by virtue of his license ; and that said license shall also conform to all the conditions and requirements of the city for his government, and in default thereof will submit to such penalties as are or may be prescribed by the City Council.

LICENSE POSTED—CHANGE OF FIRM.

Sec. 5. Any change of the firm name or location of business must be promptly reported to the Plumbing Inspector, and the license shall be kept in a conspicuous place at the place of business.

LICENSE NON-TRANSFERABLE.

Sec. 6. When two or more persons are copartners, licenses shall be issued in the name of the firm or copartnership, and no license shall be transferable.

HOUSE PLUMBING AND DRAINAGE.

Sec. 7. All plumbing and drain work in any house, or connected therewith, shall be subject to the inspection, supervision and approval of the Plumbing Inspector.

PENALTY.

Sec. 8. Any plumber who shall be guilty of any violation of any of the provisions of this article, or any of the ordinances of the city relating to the conduct of his business as such plumber, shall forfeit his license and shall be subject to a fine of not less than $10 nor more than $100.

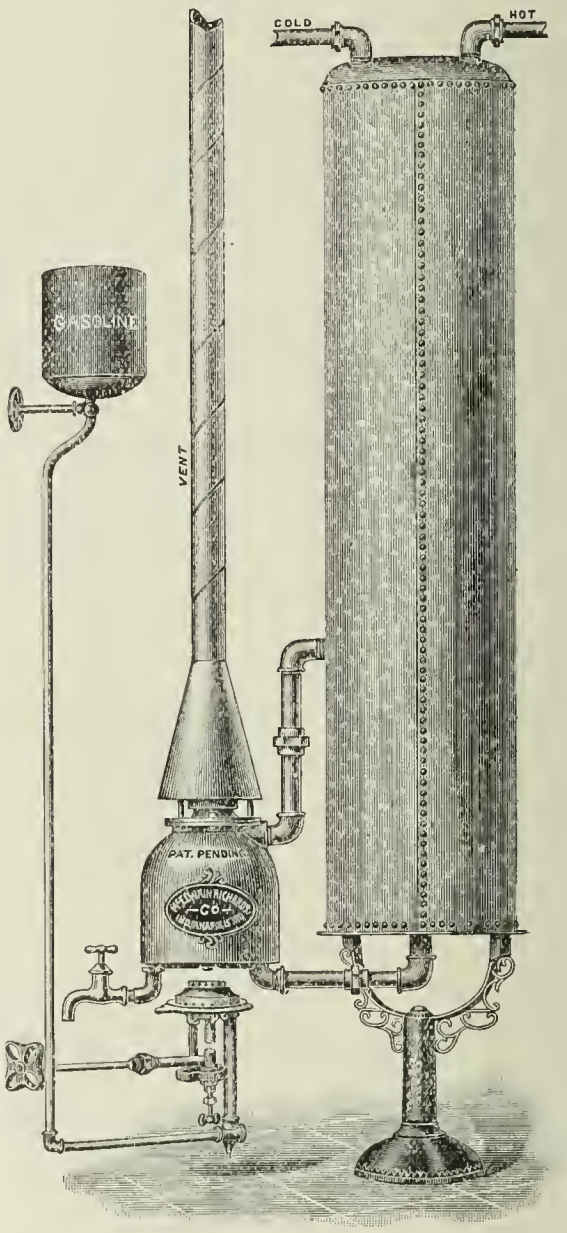
Sec. 9. All ordinances or parts of ordinances now in force in any way conflicting with the provisions of this ordinance and not contained herein shall be and the same are hereby repealed.

Sec. 10. This ordinance shall be in force from and after its passage and due publication thereof, as required by law.

We have received through the courtesy of S. L. Beidler of Mount Pulaski, Ill., circulars describing the Eagle Automatic Acetylene Gas Generator, made by Walmsley & Co., 732 Marquette Building, Chicago, Ill. Judging from the views presented in the circular the machines are made in several different sizes and capacities, the reservoirs for the gas being separated from the chamber in which the carbide is stored. With the circular comes a sheet of testimonial letters from a number of persons who have used them in residences, stores and hotels for several months, and stating that their use has been satisfactory and the expense light, that they are simple to operate, and require but little attention.

Williams Water Heater.

We show in the accompanying illustration the Williams water heater manufactured by McElwaine & Richards, Indianapolis, Ind. The heater consists of malleable iron castings, made in parts and connected together by means of flanged joints, so that they can be taken apart for cleaning when used in connection with hard water and a lime deposit accumulates. The connections are such as to readily stand a high pressure of water. A flue runs up through the center of the heater to increase



Williams Water Heater.

the heating surface and to carry off the products of combustion from the burner used in connection with it. Openings are provided at the side for connecting with the ordinary kitchen boiler, and another opening is provided for a sediment cock. Burners for using either natural or artificial gas and a special form of gasoline burner, are provided for use in connection with it. It is claimed that with this water heater the burners do not become clogged by moisture from condensation in the heating chamber. It is pointed out that the water can be heated very quickly with a small expenditure of fuel and that the vent pipe insures that there will be no odor in the house. The instructions given are that the burners should be placed 2 inches below the bottom of the heater and the vent pipe should be connected with the chimney direct or with pipe from any stove that may be used. The heater should be set on a level with or below the bottom of the boiler to insure good circulation. With this water heater it is possible to have a supply of hot water in a short time without building a fire in the kitchen range, which is looked upon as a feature of special interest for summer use.

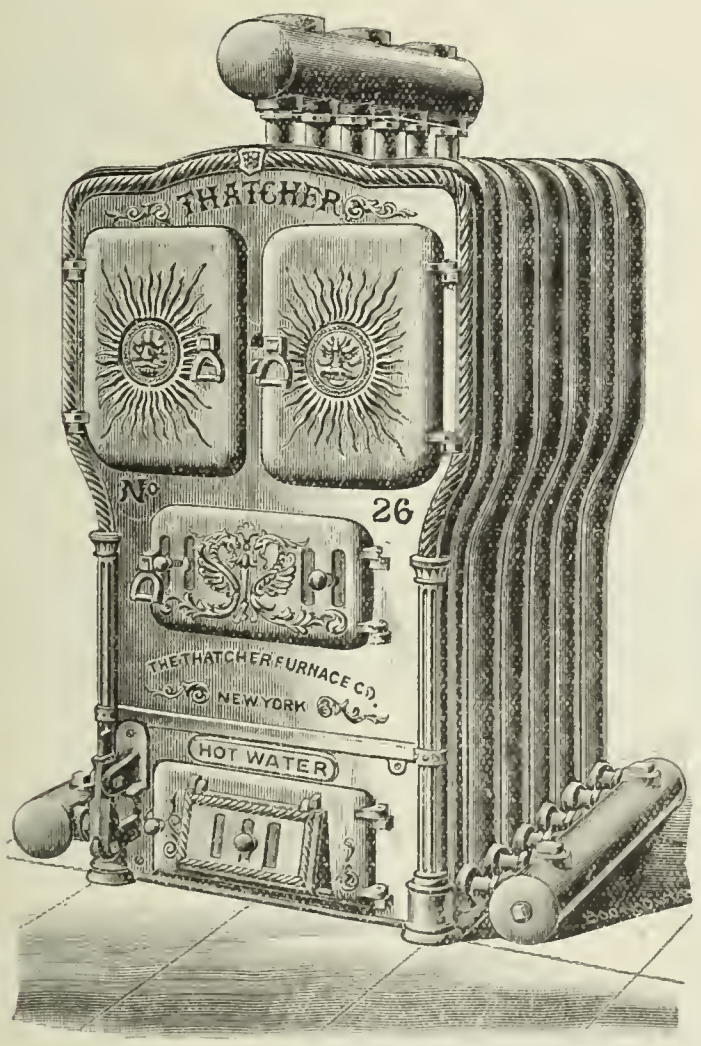
Atlanta, Ga., is somewhat exercised at present over the threatened destruction by corrosion of the city water mains, due to heavy underground electric currents. A local engineer who investigated the condition of the pipes

supplying his dwelling found that in a number of places the pipe showed a disposition of the water to "weep" through and leak and also that the pipe carried a current sufficient to run 20 incandescent lamps.

The Thatcher Steam and Hot Water Heaters.

The newest production in the line of steam and hot water heating apparatus turned out by the Thatcher Furnace Company, 240 Water street, New York City, is the Thatcher boiler shown in the accompanying illustrations. This boiler bears the name of Thatcher, and is presented by the company as a representative of the best type of the modern heater. A general view of the heater is shown in Fig. 1, from which it is readily seen that it is of attractive desigu and commanding appearance. In Fig. 2 a view of the heater is presented with the necessary trimming for use as a steam boiler, the doors being opened so that the construction and fire travel will be understood in connection with the following description: The boiler is of the vertical sectional type, connected at the top and on each side with headers by means of screw nipples, so that all joints are on the outside and any leaks can be detected and stopped. The water leg portion of the section forms the sides of the ash pit and of the fire chamber, and is provided with supports for a labor saving grate designed to be operated by means of a lever from the front. The ash pit is provided with a door for removing ashes, aud also has a draft door adapted for automatic regulation iu conection with the automatic damper regulator furnished with the heater.

In addition to the heating surface in the water leg section the construction affords a large expanse of surface by the arrangement of the crown sheet, which may be said to have an upper and lower surface. The lower surface is that which hangs directly over the fire, and by means of spaces between the sections, due to the tapering form



The Thatcher Steam and Hot Water Heaters.—Fig. 1.—General View of Water Boiler.

of the lower crown sheet, the fire plays directly on the upper crown sheet through these spaces, and also allows the products of combustion to rise and travel through the small flues shown. The fire travel is from the combustion chamber along these two crown sheets to the back of the heater, where exit is found into a horizontal retnrn flue, the travel being to the front through the lower flnes, four in number, and back again to the smoke exit through the four npper flues. By this construction it will be seen that the burning gases are divided into sheets surrounding separated colnmns of water. These water colnmns are arranged so as to allow the water to travel freely to the center of the heater and rise, affording a free and frictionless circulation for hot water heating and having the effect of maintaining a steady water line when used for steam heating.

It will be noticed that the upper part of the boiler is broader than the lower part, providing the proper proportion of flue surfaces for the amount of fire space. The boilers are said to be subjected to a heavy hydraulic pressure previous to being shipped. Being sectional in form they can be readily taken into any building, and in

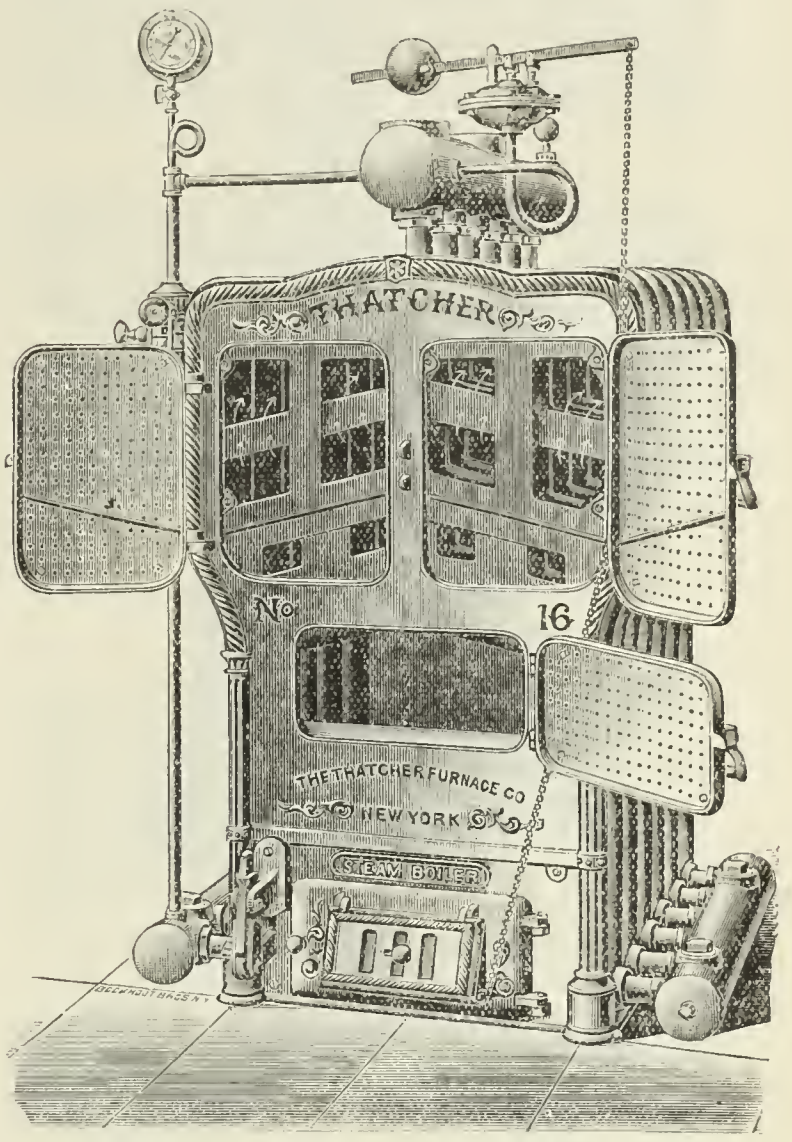


Fig. 2 — View of Steam Boiler.

case of necessity through a narrow door or even a window. They are easily set up and are adapted for the use of a plastic non-conducting covering. They are made in five sizes, standing 67 inches high and provided with a fire chamber 24 inches wide, which increases 6 inches in length with the addition of each section, the smaller sizes being composed of five sections and having a fire chamber 24 x 24 inches in size. They are rated to carry, respectively, 525, 690, 870, 1045 and 1220 square feet of direct steam radiation, and 940, 1250, 1540, 1850 and 2150 square feet of hot water radiation. These ratings are given as the capacities of the boilers in addition to the main and return pipes. Circnlars giving full description, dimensions and prices can be secnred on application to the company.

Examining Plumbers.

It was certainly a novelty, says a Peoria, Ill., paper, to see Chris Klingel, Dan O'Connor, Frank McLanghlin, Charles O'Neill and all the other master plumbers down on their knees with a furnace in front of them and wiping the joints on a couple of pieces of lead pipe, just as they used to do years ago when they were jonrneymen. The sweat rolled from them in small streams, but they stuck to their work until it was finished and then they were photographed by Jesse Sawyer, and it is safe to say that they will preserve the photographs as long as they live. The occasion was the first examination conducted by the Plumbing Board under the recently enacted law. All the master plumbers were there. First they were compelled to answer a number of questions in what is termed elementary work, after which they went through the operation of "wiping the joints," or the practical part of it Some of them did not take kindly to it, but all were compelled to submit, as the new law requires them to be licensed, and before they can be licensed they must pass

an examination. The Board of Examiners is composed of Dr. J. W. Hensley, the health officer ; Thomas McQuellon, the plumbing expert and Fred Studer.

Some of the scenes witnessed were decidedly comical. Few of the masters were willing to admit that they were taking the examination, but insisted that they were simply judges called in to pass upon the work of the others. Some of them had lost the dexterity of their younger years and persisted in getting more metal on the floor than on the joint, but with one or two exceptions all took it good naturedly and offered kind counsel to others of their number. During the afternoon quite a number passed into the council chamber to take a look at the scene and smile at the hard workers. One said the scene reminded him of a polytechnic school. All were glad when the examination was over.

Richmond Boilers.

In keeping with their aim to maintain their prominent position in the front rank of house heating boiler manufacturers, the Richmond Stove Company of Norwich, Conn., call the attention of the trade to some of their recent productions, and the illustrations herewith, and in-

Richmond Boilers.—Fig. 1.—*Broken View of Vertical Sectional Boiler.*

vite the most exhaustive analysis and consideration of the principles of construction which have been adopted by them. They refer to their long experience in and devotion to the manufacture of house heating boilers, and the practice of always giving the closest attention to the re-

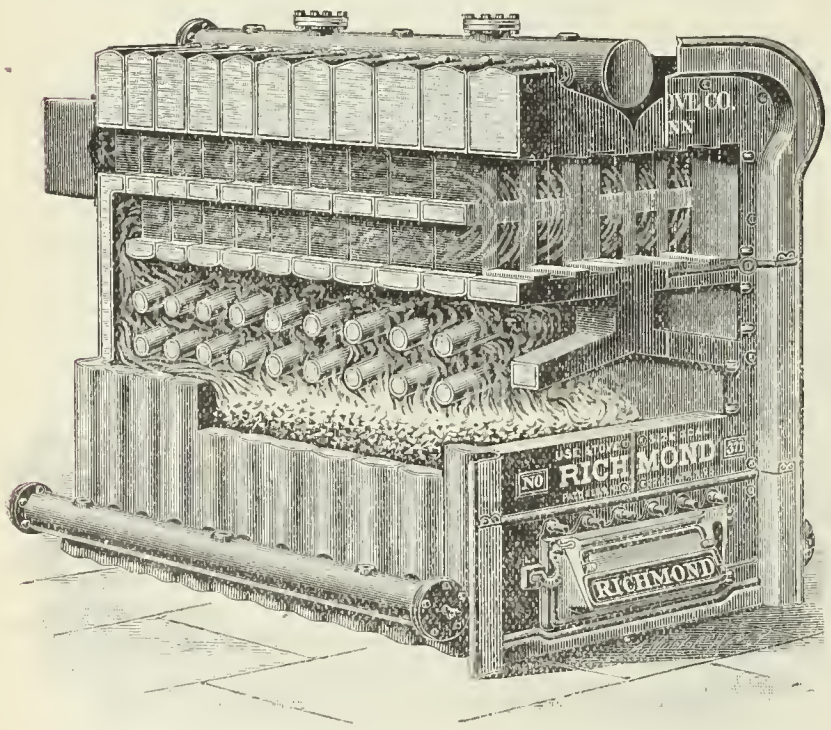


Fig 2 —*Large Boiler with Sunk Header.*

sults obtained, as enabling them to reach positive conclusions regarding the proper area of grate surfaces and fire surfaces and their relations to each other to secure the best and most economical results.

Fig. 1 shows a cross sectional view of a medium size sectional boiler for hot water, and Fig. 2 shows the construction adopted for large capacity boilers. In designing this series of sectional boilers, which embraces capacities ranging from 275 to 5000 square feet for both steam and hot water, it was sought to obtain the largest practicable fire surface within the combustion chamber, and yet in such relation to it, and of such area as to permit of the perfect combining of the gases of combustion, and as supplementary to the combustion chamber, large enough flues to carry the products in combined form to their exit in the chimney—thus getting the full benefit through the entire heater. To sum up, the distinctive features of this line of boilers, as can be seen in the cuts, are : Large com-

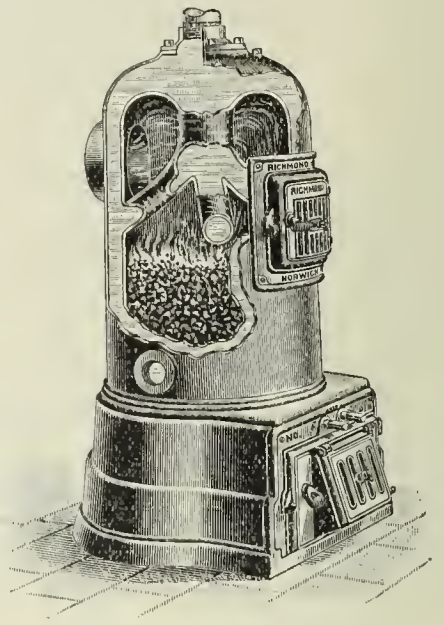


Fig. 3 —*A Hot Water Heater for Small Houses.*

bustion chamber, large direct fire surface, large flues, vertical circulation, no joints between sections, large ash pit and ease of cleaning. If this style of boiler meets with an accident, and one or more sections are broken, those sections may be cut off from the service and the balance of boiler continued in use until new sections arrive. It is a simple matter to insert new sections and increase size of heater, if more work is required than proposed when heater is installed. The absence of gasket and other joints and the relief from mason or brick work are valuable provisions which the contractor will appreciate.

The company explain that by keeping in closest touch with their representatives and customers from the Atlantic to the Pacific, they have become familiar with the varying conditions of different localities, and have produced other styles of boilers to meet special requirements. Special attention is called to the new line of small house heaters, known as the 0 and 900 Series, the 0 Series being for hot water, illustrated herewith. The 900 Series is enlarged at the upper section to form a steam chamber. The fire pot and dome of this boiler is cast in one piece. It has no joints of any kind, and is described as practically self-cleaning. The combustion chamber is large, and the manufacturers have introduced a large amount of direct fire surface to make the boilers quick acting in making steam.

The L. & G. Plumbing Specialties.

The success of the Lalance & Grosjean Mfg. Company, 19 Cliff street, New York City, in manufacturing enameled ware for household purposes is well known. The com-

The L. & G. Plumbing Specialties.—Fig. 1.—*Enameled Sink.*

pany are now putting on the market a line of stamped steel specialties for plumbers' use, which are furnished painted, galvanized, blue enameled and in two styles of mottled enamel. It is pointed out that these goods being stamped up from steel are not liable to breakage as is cast iron, and being less rigid the enamel adheres well.

In Fig. 1 we show a kitchen sink with a wide turned edge. These sinks are made in seven sizes from 16 x 24 to 20 x 40 inches and 6 inches deep. As the enamel finish en-

ables them to be easily cleaned and prevents the adherence of foul matter, it is pointed out that the sink has a peculiar sanitary value. In Fig. 2 we show a steel back which can be furnished in the same different styles of finish and adapted for the various sizes of sinks made, and provided with openings through which the faucets may be con-

Fig. 2.—Enameled Sink Back.

nected. Holes are also provided for fastening, and owing to its being made of steel, it is claimed that it can be secured more tightly against the wall. The lower edge of the back is provided with an extension so as to prevent a leakage at the joint between the sink and the back. Fig. 3 shows an adjustable bracket adapted for the various sizes of sinks made by the company. Fig. 4 shows a round lavatory bowl which, being made of wrought steel, is not liable to breakage and being finished with enamel can be kept as clean as and possesses many of the advantages of the best earthenware. The company point out that their trade in these goods throughout the United States is increasing, and owing to the steel being strong and light it reduces the items of breakage in transportation and freight charges. It is also pointed out that the prices at which these goods

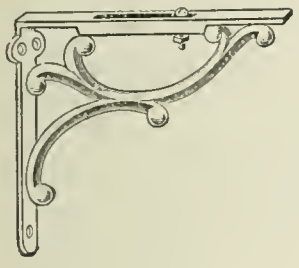


Fig. 3.—Adjustable Sink Bracket.

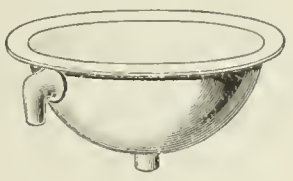
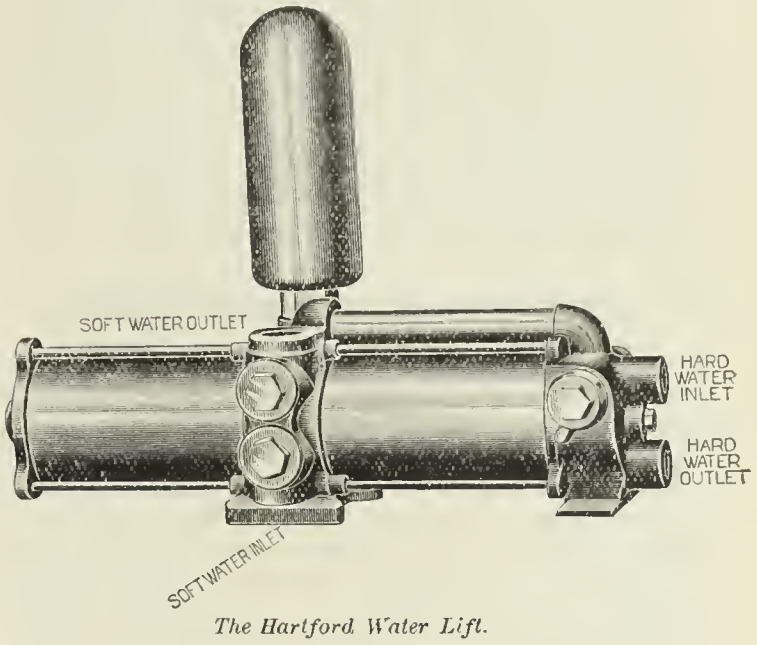


Fig. 4.—Enameled Lavatory Bowl.

can be sold is another of their attractions. The company issue a 16-page pamphlet giving full particulars in reference to these goods, which can be secured on application.

The Hartford Water Lift.

The automatic water lift or motor pump shown herewith, which is being put upon the market by the L. E. Rhodes Company of Hartford, Conn., has many novel features, and examples the high development which has been reached in small machinery of its class. It consists of two cylinders with two sets of valves and a common piston rod, one cylinder receiving the city water, by the pressure of which the power is obtained to operate the opposite cylinder acting as a double pump. By making the pump cylinder smaller than the power one a high pressure is obtained and city water may be forced and distributed through the pipes at a higher level than it would naturally flow, or cistern water may be raised by the city pressure, or in some instances (as in feeding mixed hard and cistern water to boilers) a combination of different liquids may be distributed. There are well-known devices in use for these purposes, and the novelty of this particular lift lies in various points of design whereby, the manufacturers claim, material advantages are obtained. The chamber for the pump valves acts as a partition between the two cylinders, with the piston passing through a deep stuffing box—the only one in the machine. By this method the working parts of the device are brought compactly together, and it is made possible to remove or change the pump cylinders without interfering with the piping or main body of the machine in the least. In addition to this each lift is ingeniously arranged to take three different sizes of pump cylinders, and consequently at a trifling outlay for an extra cylinder one size of lift can be varied to suit widely different conditions and purposes. This feature is appreciated not only in localities where the shifting water pressure in the city mains demands machines with a great variation in the relative size of pump and power cylinders, but more especially by plumbers and dealers handling these machines, who now need only carry perhaps a single lift to cover all the variations in size. The cut off valve is arranged to seat like a faucet at each stroke, so that absolute tightness is obtained, and at the same time the objectionable wear is avoided which results where the packings pass back and forth over a series of small holes. No oil is needed, and the valve being balanced cannot wear unevenly or stick. A feature that at first sight may seem trivial, and which is yet very valuable, is the placing of the working parts all in one line. This avoids any tendency to push the piston rod to one side, causing it to become worn or the stuffing box to leak, and in fact adds immensely to the efficiency and durability of the lift. All delicate springs, eccentrics, &c., are



The Hartford Water Lift.

avoided, and there are no working parts on the outside, although they are easily accessible. With large ways making it self-cleaning, entirely automatic and self-regulating, not requiring oil or frequent attention, the maintenance of this machine in any household is a simple matter. The same attention is given to accurate workmanship and durable material as in the Spencer organ motors and the Hartford air compressor, other specialties of these manufacturers.

Climax Automatic Air Valves.

In the accompanying illustrations we show a new automatic air valve called the Climax, which is being manufactured by the Judson A. Goodrich Company, 228

Climax Automatic Air Valves.—Fig. 1.—A Transparent View, Showing Construction.

Fig. 2.—Valve for Use Without Drip Pipe.

Water street, New York City. In Fig. 1 a transparent view is given showing the construction of the different styles of Climax valves. The action of the valve is due to what is claimed to be an indestructible composition expansion piece, arranged so that by unscrewing the small cap at the top of the valve it may be adjusted with a

screw driver or withdrawn and renewed in case of necessity. A guide plate for the expansion piece, which is rigidly held at the top, also serves as a diaphragm to prevent water being driven out of the valve. In operation, the condensed water falls on the inner wall to the bottom of the valve, where it is carried off by means of the drip pipes arranged by the heating contractor.

The valve is also made provided with a union for connecting the drip pipe instead of making a direct connection as shown. In this form there is no escape of steam, water or odor into the room, and the valve is well qualified to meet the modern requirements for sanitation. In Fig. 2 the valve is shown designed to be used without any drip pipe connection, the large surface presented by the valve being intended to serve as a condenser for any steam that may escape into it, and to provide a body of water, kept warm by the radiator, which may evaporate and provide moisture for the room in which it is used. The valves are made for ⅛ x ⅛, ⅛ x ¼ and ¼ x ¼ inch connections. Circulars giving full description, dimensions and prices can be secured on application to the company.

DISSATISFACTION AMONG WESTERN PLUMBERS.

It is reported that the master plumbers of some of the Western States are considering the propriety of forming a separate and independent organization on the lines of the National Association, with the special purpose in view of conserving the interests of the West. Dissatisfaction has arisen over some questions in which it is claimed the Eastern members have exercised undue influence in the national body. The largest membership in the National Association being in the East, the charge is made that the interests of the West are not so well cared for as they would be with a purely Western association composed of a membership residing in Western States. Those who are familiar with the methods of the National Association believe these charges to be unfounded, and are of the opinion that the interests of all sections can best be served through one organization composed of delegates from all the States. No better way to promote jealousy between the East and the West could be devised than through the formation of a rival organization claiming to be of a somewhat national character. It would certainly be difficult to secure perfect harmony on all questions, and much of the influence of the great organization built up by hard labor extending over a long series of years would be dissipated. The better plan seems to be the adoption of the methods now followed in some other sections, of forming interstate organizations to work under the National Association and not in opposition to it. Local questions of great importance can thus be handled in direct line with the policy laid down by the main body, but which may need closer attention than can be given by its officers.

A Proposed Sewer Pipe Combination.

A press dispatch from Steubenville, Ohio, states that preliminary steps have been taken by the sewer pipe manufacturers of Eastern Ohio toward entering a combine of sewer pipe manufacturers of the United States, to be capitalized at $11,000,000, which will control the entire manufacture of sewer pipe and terra cotta ware in the United States. At a secret meeting held at Pittsburgh last week 19 manufacturers are said to have signed the agreement. There are 31 other concerns in the same line in the United States, most of whom are also expected to sign. It is proposed if all the manufacturers sign to appoint appraisers who will appraise each plant in the country. If the appraisement is accepted each manufacturer is to receive 25 per cent. of the value of his plant in cash and the balance in preferred and common stock of the new company. Another meeting is to be held shortly in a Western city, and at that time it will probably be definitely known whether or not all the manufacturers will sign the agreement. If they do not all sign it is said the new company will not be formed.

The Judson A. Goodrich Company, 228 Water street, New York, a company recently formed for the manufacture and sale of steam specialties, have elected the following officers : President, Judson A. Goodrich of New York ; vice-president, Richard D Knight of Providence, R. I., and secretary and treasurer, R. Ward Hillman of Brooklyn, N. Y. The new company will be under the management of Judson A. Goodrich, who is well known and has a large acquaintance in the steam and hot water heating trade.

NOTES.

Justice John A. McGowan of Maywood, Ill., has invented an apparatus for thawing frozen ground, and will shortly place it on the market. The machine is equipped with a number of pipes and coils, and the general idea is to generate hot compressed air from the combustion of petroleum gas. The hot air will be forced through an asbestos hose into the frozen ground. The inventor claims that the machine will be of particular value in gold digging operations in the Klondike. Patents have been applied for in the United States and Canada, and a company will shortly be formed for the manufacture of the machine.

Bennett & Hammer, Pittsfield, Mass., have the contract for installing the steam heating system in the new block being erected by Gimlich & White.

T. J. Leonard, Marlboro, Mass., bid $969 and secured the contract for plumbing the new High School Building.

The authorities of Sea Isle City, N. J., have passed an ordinance whereby plumbers who do not leave the streets in good order after making sewer and water connections will be fined $25.

John Drexel, Jr., Reading, Pa., has been awarded the contract for the plumbing and gas fitting in 18 houses, which are being erected by Jeremiah Benner. He is also doing the same work in the parsonage of the Rev. John Brown, at St. Lawrence.

Broomell, Schmidt & Co., York, Pa., have the contract for the Boilers and Steam Heating Apparatus for the new Hotel Monticello, at Norfolk, Va., using the Webster vacuum system.

B. P. Waggoner of Atchison, Kan., has been granted a franchise by the Atchison Council to lay the pipes in the street and build a plant for a steam heating system.

The Gorman-English Company, Wilkes-Barre, Pa., report that they are very much pleased with the reception which has been given by the trade to their Radiator Rests in all parts of the country. They state that they have received the approval of the leading architects and engineers.

The L. J. Mueller Furnace Company, Milwaukee, Wis., have secured the contract for supplying the city of Wauwatosa with a water and storage system for $17,947.

W. H. Meeker, South Norwalk, Conn., has been awarded the contract for heating and ventilating the new Franklin Schools.

Bids will be received until November 16 by the Supervising Architect, at Washington, D. C., for the heating, ventilating, water supply and filtering system for the United States Appraiser's Warehouse at New York City.

The contract for plumbing the new High School Building at Springfield, Mass., has been awarded to the Phillips Mfg. Company of that city for $11,220.

Frank Kelley, Gardiner, Maine, a well known Stove dealer and plumber, was quite severely burned recently through an accident with a gasoline furnace while doing some plumbing for a customer.

We acknowledge the courtesy of President Thomas P. Cullotin of the National Association of Master Plumbers in sending us a copy of the amendments and resolutions passed by the association relating to the Baltimore resolutions and the interpretations and duties of members of the association, and with it a list of the manufacturers and dealers in plumbing goods who are in accord with the Baltimore resolutions.

Sealed proposals for supplying heating and ventilating apparatus and an electric lighting plant for School No. 20 will be received until November 8 by the Committee on Buildings of the Board of Education of New York City.

James Flower, Bro. & Co. of Detroit, Mich., agents for the A. A. Griffing Iron Company's line of Steam Specialties, Traps, Separators, Feed Water Heaters, &c., are meeting with very encouraging success in the sale of these goods. They are transmitting orders almost every day to the factory at Jersey City, besides carrying a stock of the goods at Detroit. They will be pleased to give full information and prices to the trade.

The A. A. Griffing Iron Company, Jersey City, N. J., report an order from the warden of the Kingston Penitentiary, Toronto, Canada, for two No. 207 Bundy Gravity Pumps sold by Capt. Thos. Howard of Montreal. This marks the opening of a business with the Canadian Government, which bids fair to assume quite favorable proportions, as they have many plants in which these devices can be used to good advantage.

James M. McDonald, treasurer of the James McDonald & Sons Company, Tinners' and Plumbers' Supplies, manufacturers of Tin Plate, Cincinnati, is accredited with the following observations by a local paper : "During the

past six weeks the volume of our business has increased to such an extent that we are now selling more goods than ever before. Prices are still low, however, and the margin of profit is not what it used to be before hard times came. We see in our increased sales a much improved condition and are confident prosperity is here."

Thomas J Rice has recently opened a store at 538 State street, New Haven, Conn., to conduct a plumbing, steam fitting, tinning and gas fitting business.

C. F. Blaisdell, York Corner, Maine, is doing the plumbing and placing a Glenwood Furnace in the residence of R. B. Morgan.

A. Craig, Fargo, S. D., is remodeling the steam heating plant in the Hotel Columbia at Moorhead.

David Lott, Birdsboro, Pa., is placing a steam heating system in the shoe factory of L. L. Fountaine.

The Building Commissioners and the Board of Health of Bridgeport, Conn., have appointed a committee to meet with a committee of master plumbers with the view of drafting an ordinance for the regulation of plumbing in that city.

J. W. Quinman has opened a plumbing shop in Farrell's Block, Bemis, Mass.

William Whiting will open a plumbing and steam heating establishment in the north end of Booth Block, at Stratford, Conn.

The American Public Health Association has been in session this week in Philadelphia, and the report of the Committee on Sanitation was prepared by J. W. Hughes of Montreal. In the absence of Mr. Hughes the report was read by Crosby Gray. A variety of devices and apparatus interesting to sanitarians was displayed at the convention.

The D. M. Steward Mfg. Company, Chattanooga, Tenn., are placing on the market a number of new lines of Slate Pencils and Gas Burners, and are about to add a building to their plant which will, they say, double their floor space and greatly facilitate the handling of orders which the improved condition of trade has brought them.

Edward C. Chappelle, Ithaca, N. Y., favored *The Metal Worker's* Philadelphia office with a call a few days since. He was visiting that city for the purpose of purchasing Plumbing Supplies for his new store. He would like to receive catalogues from manufacturers of Plumbing and Heating Supplies.

Robert K. Story, 44 Centre street, New York, is on a business trip in Pennsylvania among the steam fitting and plumbing trade in the interest of the Marsh Air Valves and the Detroit Radiator Valves and his line of Steam Specialties.

Secretary Alexander Don of the W. H. Page Boiler Company, Norwich, Conn., is in town assisting Manager Johnson of the New York office, at 61 Gold street, in attending to the trade on Hornet, All Right, and Volunteer Steam and Hot Water Heaters.

President W. C. McMullin of the Richmond Stove Company, Norwich, Conn., spent a day with C. F. Houss, manager of the New York office, at 85 Centre street, this week, with a view to increasing the trade on the Richmond line of heating apparatus.

E. E. Horton, one of the representatives of the Thatcher Furnace Company, 240 Water street, New York, informs us that Goodrich & Eitopenc, Worcester, N. Y., have the contract to heat the Worcester House with a Champion Steam Boiler.

Application has been made to the Illinois Secretary of State for a charter for the Walcott-Webster Mfg. Company of Chicago, with a capital stock of $100,000, fully paid in. Under this charter it is proposed to consolidate the concerns of the Walcott-Hurlbut Company and Smith & Webster, both of Chicago.

A novel condition exists between a Pennsylvania plumber and his wife. His wife contracted with him to do the plumbing work in a house which she was building, and having done extra work and repairing without orders from her she refused to pay the bills until the matter was disposed of in court, where a portion of the claims made were granted.

A. H. G. Hardwicke, who has conducted the Hardware business of Hardwicke & Co., Niagara Falls, N. Y., for several years past, has decided to sell out, and will be succeeded on November 1 by Walker & Paterson. Mr. Hardwicke announces that he will go into the general contracting business. Mr. Walker of the succeeding firm is a son of ex-Senator Walker of Batavia, and Mr. Paterson was formerly president of the Paterson Hardware Company of Austin, Pa. The new firm are desirous of hearing from manufacturers with catalogues, quotations, &c. Besides handling a general line of Hardware they are interested in plumbing, steam heating, roofing and sheet iron work.

El Paso Plumbers' Association.

The master plumbers of El Paso, Texas, have lately formed a local association of master plumbers in that city, with the following membership :

F. Wild & Co.
McLean & Keayes.
Louis Gasser.

The officers elected are :

President, Richard Keayes.
Secretary, Fred. Wild.
Treasurer, T. E. Hunt.

American Machine Tools in England.

The following from the intensely English London *Engineer*, on American machine tools, will be read with interest : The use of the machine tool in America is entirely unrestricted. The development of it has therefore made great strides. The importation of American tools into this country need not, however, be regarded with the slightest uneasiness. We have not the least hesitation in saying that many English firms can and will produce tools as good as those now being imported. The American tool is not entirely adapted to English work, and in certain respects is distasteful to the British workmen. It would not be easy to say why in all cases. The matter is one of taste, just as a Scotchman blows his bagpipes with his mouth while an Irishman blows his with his elbow. Equally attractive music is to be got out of both, but heredity prejudices each nation in favor of a particular type In other cases it is perfectly easy to account for the Englishman's dislike. One or two of these reasons we may point out. A noticeable feature of American tools is the shortness of crank handles or their replacement by little wheels. We do not question that the American arrangement is designed to give the same power approximately as the English device. To the English mind, however, it does not give the same sense of power and security. Moreover, the control is unquestionably less complete and the labor is rather increased if anything. Not long ago we saw a large American lathe by a well-known firm at work. It was in many respects an excellent tool. The foreman in charge of it said he believed it was a good machine, but nevertheless he did not like it and never felt quite at home with it. One of his chief objections was that whereas he was accustomed to a long rack handle always well within reach of hand or toe, and having a good, steady working leverage, the tool under discussion had quite a short counterbalanced handle and not only needed many rotations to run the slide rest back, but, as we have said, left the operator without the sense of the power of controlling his machine. There are other points, too, which a cursory examination reveals. The most potent is the use of a simple instead of a compound rest on lathes fitted with taper gear. Practically all English lathes have two hand screws on the rest, giving motions normally at right angles, one parallel with and the other perpendicular to the lathe centers. The American, however, uses the latter only. Now in English shops the former gear is used universally for adjusting the cut when facing, and the absence of it is consequently embarrassing. The American does the same thing by clamping down the lead nut and turning the leading screw by hand. We do not doubt that very good work can be done in this way—our cousins are excellent mechanics—but it does not strike one as being so convenient as the method to which we are accustomed and from which we shall not depart readily. Other points in which American and English practices differ will occur to users and makers of machine tools. We think most of our readers will agree with us that the Englishman prefers an English made tool.

We are none the less perfectly ready to admit that American tools are in many respects ingeniously devised and excellently constructed. Makers in this country have much to learn from them ; that they will learn much and turn their knowledge to good account we do not doubt for a moment. In making his designs the Englishman will find that the American practice is unsuitable in several respects. It must not be forgotten that American cast iron is a far softer material than ours. Higher speeds and greater feeds can, in consequence, be used than are ever employed here. The very same fact renders alteration in the design of the main castings of a machine necessary. Besides these vital points there are less important details which need observance if outrage is not to be done to the conservatism of English engineers and mechanics. On the whole, therefore, a slavish copy of American tools is as little likely to make much progress in this country as the original tools themselves. We want automatic machine tools, but we want them stamped with our own and not American characteristics.

TIN PLATES.

Slack Demand for Terne Plates.

The disappointingly slow demand for roofing ternes this year is a matter of sharp complaint among manufacturers of and jobbers and dealers in these plates. Some good judges in the trade estimate the falling off in the consumption of roofing tin during the past season at from 40 to 50 per cent. as compared with the average of the past few years. Various reasons are given for the same, none of which are flattering to the hope of any early expansion in the demand for these plates for roofing purposes. It is generally claimed that other materials, such as wood and metal shingles, galvanized iron, copper and slate, have been used this year on the roofs of many buildings in which tin would usually have been employed. Zinc, too, is said to be coming out as a material for roofing purposes, and in New England some kind of cement compound is reported to be gaining favor as a roof covering. Just why this neglect of tin roofing should be in evidence at the present time is not explained. No specific complaints are brought against it. The old tin roofs, made from imported terne plate, are found to have served their purpose excellently well, and it is certain that the high grade terne plates now being made in this country are the peer in every respect of any that were ever made on the other side of the water.

SCRAP.

In a neat double card, Mortimer H. Cort, successor to N. L. Cort & Co., 9 Burling slip, New York, calls attention to his special brands of Roofing Tin. These are Cort's New Method Redipped, Cort's Old Style, Cort's IC Roofing, Atlantic, Empire State and Reno. All these Plates are made for Mr. Cort in American mills, only the very best quality of material being used in their manufacture.

The Wheeling Corrugating Company, Wheeling, W. Va., who for nearly three years past have been operating a Tin Plate dipping works of five stacks, are reported to be figuring on the erection of a complete Tin Plate plant in connection with their Corrugated Iron manufacturing business.

It is reported that the Humbert Tin Plate Company of South Connellsville, Pa., have leased and will operate the two mill Tin Plate plant of the Stickney Iron Company, at Canton, Baltimore, Md. The plant was erected over two years ago, but has never been run, except experimentally.

The United States Iron & Tin Plate Mfg. Company, Demmler, Pa., will considerably enlarge and completely remodel their present plant. It is proposed to add four new tin mills, making it an eight-mill plant, at the same time maintaining their present sheet mills for the production of the United States polished sheet steel, in the manufacture of which the company have achieved a decided success and for which there is always a very large demand. The cold roll and annealing as well as the tin plate department will be remodeled and enlarged correspondingly.

M. M. Garland, president of the Amalgamated Association of Iron and Steel Workers, has issued a valuable table, giving for a long series of years, month for month, the selling price of bar iron, the puddling rate, the bar mill heating and rolling rate, the selling price of No. 24 sheet iron, the rolling price for sheet iron, and since 1890 the price of tin plate and the rolling rate.

The original intention of the recently incorporated West Leechburg Steel & Tin Plate Company, West Leechburg, Pa., to build a Tin Plate plant, has been changed. The company have decided to manufacture only fine Cold Rolled Steel Strips for the present. The officers of the company are Alfred Hicks, president ; J. W. Kirkpatrick, vice-president ; J. L. Kirkpatrick, treasurer ; Jas. Lippincott, secretary, and F. R. Kenyon, general manager. The Messrs. Kirkpatrick are members of the firm of Kirkpatrick & Co., manufacturers of Sheet Iron and Steel, whose mills are located at the same place.

Not the United States alone, but Italy also, is drawing off the idle Tin Plate workmen of South Wales. A large number of Kidwelly tin platers are reported to have recently left for Italy to work at La Magona d'Italia Tin Plate Works, at Piombino, in Tuscany.

"*Griffith's* List of Tin Plate Manufacturers and Brands," dated October 16, 1897, gives 16 Tin Plate works in South Wales and Monmouthshire, with an aggregate of 116 mills, as entirely idle or for sale. These include such well-known concerns as the Ashburnham Works, Burry Port ; Burry Tin Plate Works, Llanelly ; Cwmfelin Works, Swansea ; Pontypool Works, Pontypool ; Port Talbot Works, Port Talbot ; Gwendraeth Works, Kidwelly ; Worcester Works of Wm. S. Williams & Co., Morriston, and all four of the plants of Philip S Phillips & Co.—namely, the Abertillery, Lion, Pontymister and Machen Works, having an aggregate of 35 mills.

The Leechburg Foundry & Machine Company, Pittsburgh, Pa., have booked an order for a No. 2 Mesta Pickling Machine, arranged to pickle long sheets, for the Hyde Park Iron & Steel Company, Hyde Park, Pa. They are also supplying a No. 2 Mesta Pickler for the new plant of the West Leechburg Steel & Tin Plate Company, West Leechburg, Pa.

The new Tin Plate plant of Hamilton & Co., at West Newton, Pa., is progressing toward completion and will probably be ready for work within a few weeks.

The new Black Plate mill of Zug & Co., Limited, Pittsburgh, Pa., started up last week.

The new Bar mill of the American Tin Plate Company, Elwood, Ind., will be running within a week or two, giving employment to a number of additional hands.

The contract for the new six-mill Tin Plate plant of the Laughlin Nail Company, at Martin's Ferry, Ohio, has been placed with the Totten & Hogg Iron & Steel Foundry Company, Pittsburgh, Pa. The order includes buildings covering an area of 65,500 square feet of ground, a 1500 horse-power Ætna rolling mill engine, three smaller engines, with boilers, eight hot mills and eight cold mills, three electric traveling cranes, shafting, pulleys, &c., roll lathes, 17 pair of shears, one heater, and pickling, tinning and branning machines to equip the tin house.

Such good progress is being made with the new eight-mill Tin Plate works, which the National Tin Plate Company are erecting at Monessen, Pa., that they expect to be able to start up a portion, at least, of the plant before the close of the year. Four mills will be put in operation at first, the other four being added later.

The Canonsburg Iron & Steel Company, Canonsburg, Pa., have decided to add two new hot mills to their Tin Plate plant. They are about to discard one of their Bar mills and alter the present plant in other directions, so as to increase their capacity for the production of Tin Plate and Sheet Iron.

The Neshannock Sheet & Tin Plate Company, who have organized, as reported last week, to take over the Arethusa Sheet Mills, at New Castle, Pa., are reported to have placed a contract with the Leechburg Foundry & Machine Company, Pittsburgh, Pa , for converting four sheet mills into tin mills, furnishing the necessary rolls and providing a Mesta pickling machine, &c. It is probable that the company will not at first operate a tinning department.

A special cable dispatch of October 27 from London, states that the Welsh Tin Plate Workers' Union have decided to accept a 15 per cent. reduction from the 1874 wage list, commencing November 1.

The Frank-Kneeland Machine Company of Pittsburgh, Pa., manufacturers of Rolls, Rolling Mill and Tin Plate machinery, advise us that trade with them is very good, they having entered some large orders this month for heavy machinery. Among these is a contract for two additional Mills and other equipment for the Pennsylvania Tin Plate Company, New Kensington, Pa.; a Universal Mill, Transfer Tables and Shears for the Granite City Steel Company, St. Louis, Mo., and a 26 inch heavy Sheet Mill and Tables and Shears for the Reeves Iron Company, Canal Dover, Ohio. In addition to the above contracts, the firm have received other orders for Shears, Sand and Chill Rolls and General Castings, and regard the outlook for the future as extremely encouraging.

THE RETAIL STORE.

An Incandescent Petroleum Lamp.

The long promised incandescent petroleum burner of the Incandescent Gas Light Company, Limited, says the London *Gas World*, is now a substantial entity. Evidently the company have exercised extraordinary caution in developing their petroleum burner, and the result they have now achieved amply justifies the time occupied in

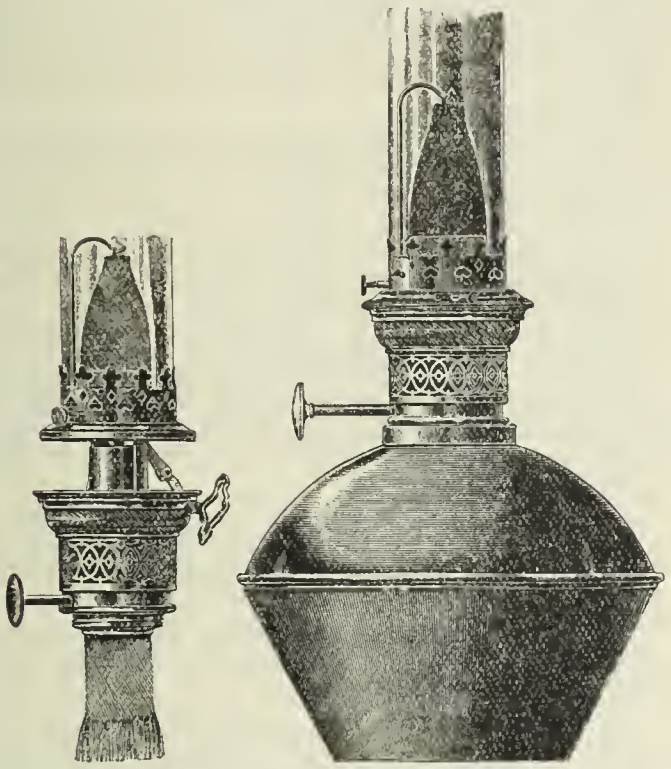


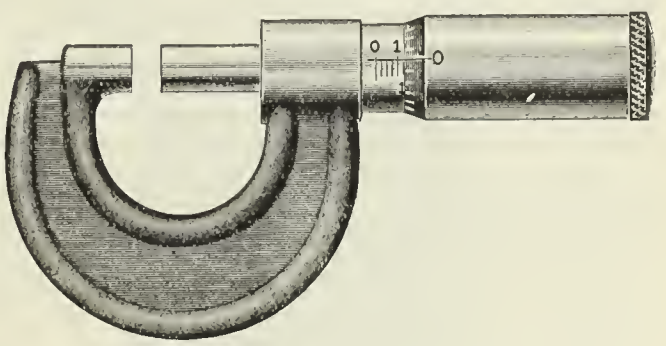
Fig. 1. *Fig* 2.

An Incandescent Petroleum Lamp.

attaining it. The new lamp is simplicity itself, and but for the mantle and a rather tall chimney it might pass anywhere as an ordinary oil lamp. Indeed it can be converted into such with the greatest ease. The blue flame necessary to the Welsbach mantle is obtained in this burner by currents of air drawn up on both sides of the circular wick, and the adjustment of the wick to obtain the blue flame can be made easily and accurately, it being only necessary to turn up the wick till the flame is on the verge of making a noise like that of a miniature fog horn. Experiment shows clearly that the maximum incandescence of the mantle is obtained when the flame is just below the sounding point, consequently the lamp may be said to be its own protector against bad usage, for no one, however careless, would tolerate the noise it makes when the wick is turned up too far. When the lamp is to be lighted the wick is exposed by lifting the gallery carrying the chimney and mantle by means of a patent lifter, Fig. 1. The wick having been lighted the gallery is lowered and the wick turned up till just below the sounding point, when everything is in proper working order, Fig 2. The light given by the mantle seems softer to the eye than that given by the Welsbach gas mantle, which may be due to the wider mesh and coarser texture of the fabric. The oil found best adapted to the lamp is American oil of about 760 specific gravity, but we are informed that oil of any specific gravity, up to Scotch shale oil, can be used, the only difference being that with the heavier oils the wick and burner require cleaning more frequently. With the 760 oil it is only necessary to trim the charred edge of the wick once in every six or seven days, while with heavier oils it may require attention every day. But to those accustomed to the use of oil lamps this trimming will present no difficulty. What may be called the incandescent portion of the burner is attached to the burner proper by a bayonet joint, and when this has been removed the user has to deal with what is practically an ordinary oil lamp. Consequently, trimming, cleaning and filling introduce no new feature to the habitual user of oil lamps. We are informed that the lamp gives an average of 45 candles with one-third the oil consumption of an ordinary lamp of similar power. The burner, which has been named the Era, can be fixed to any duplex lamp supplied with screw or bayonet fittings, and in the event of a mantle not being available at the moment it can be converted into an ordinary luminous flame burner by the addition of a special cap supplied for the purpose. The lamp can be swung about in a manner that would be almost certainly fatal to an ordinary oil lamp, and the way in which those best acquainted with its ways blow directly down the chimney sets the recommendations of the London County Council at defiance. By the introduction of this burner the Incandescent Gas Light Company seem to have made almost as big an advance in oil lighting as was made ten years ago in gas lighting by the introduction of the incandescent gas burner. It promises to find general acceptance where gas is not available, and for the gas manager who may fear its competition we have a word of comfort. The price of the burner is such that it will not appeal very strongly to the class that the gas companies are now so successfully wooing from the oil lamp to the slot meter. It should be mentioned that the Era burner is only licensed for use with Welsbach mantles and that only Welsbach mantles are allowed to be used with Era burners.

One-half Inch Micrometer Caliper.

J. T. Slocomb & Co., 235 Eddy street, Providence, R. I., have put on the market a ½-inch micrometer caliper, as shown herewith, the internal arrangements of which are the same as their 1-inch size caliper. The tool illustrated is light, weighing 1¾ ounces, and is designed as a pocket sheet metal and wire gauge, and for measuring anything within its range. It is intended to take the place of the ordinary wire gauge for obtaining the size of wire and the thickness of sheet metal in decimal



One-half Inch Micrometer Caliper.

parts of an inch, instead of by numbers or letters. The point is made that it will remain accurate, as there is an adjustment providing for wear.

Miller, Sloss & Scott.

Miller, Sloss & Scott, San Francisco, Cal., have just issued a general catalogue of 1236 pages, handsomely printed, bound in cloth and leather. The book is known as Catalogue No. 7, and was published on the sixth birthday of the firm. The press work was done by a San Francisco firm. The catalogue is divided into seven departments, as follows :

	Pages.
1. Tools and Farming Implements	2 to 276
2. Locks, Latches and Builders' Hardware	278 to 674
3. Miscellaneous Hardware	676 to 852
4. Pocket and Table Cutlery, Razors, Shears, Plated Ware, &c	854 to 1022
5. Guns, Pistols, Ammunition, Fishing Tackle, &c	1024 to 1148
6. Brass and Iron Valves and Fittings, Steam, Gas and Water Supplies	1150 to 1202
7. Iron, Steel, Rails, Metals, Cast and Wrought Pipe, Tubes, &c	1204 to 1236

The parts of the catalogue pertaining to each of these departments are also published separately in bound form and distributed among parties who are interested only in particular departments. The aim throughout the work has been to illustrate and describe in a plain, compact form the various lines of goods carried in stock, using

manufacturers' lists and numbers as far as practicable. On goods not having a manufacturer's number or list the firm's own numbers are used to facilitate ordering and to avoid errors. Lists are made in this connection to show comparative values. No discount sheet is issued, owing to constant changes in prices, but inquiries will always receive immediate attention. Mail orders are made a specialty of, and are filled at lowest market prices. A full page illustration shows the firm's establishment, 18-22 Fremont street, and another page is devoted to a picture of their warehouse. The department index is followed by a general index of 34 pages, this being cross indexed to assist in readily finding any article desired. The book is well printed on a good quality of paper, with excellent illustrations. The matter on each page is well arranged, leaving sufficient blank space for merchants to enter discounts or to note changes in list prices. This is an especially complete, comprehensive and well arranged catalogue which reflects much credit on the enterprising house issuing it.

Brownfield's Buyers' System.

The Folding Paper Box Company, South Bend, Ind., are doing an increasing business in Brownfield's Buyers' System, a system for preserving for immediate reference catalogues, quotations, price-lists, discount sheets, special memoranda, samples, clippings from trade journals and buyers' printed or written information of every description. A cabinet with subject and catalogue boxes, index, catalogue cards, gummed labels and quotation memoranda blanks are included in the system. Complete directions to be followed in the successful use of the system accompany each outfit. Cabinets of different sizes are furnished suited to the requirements of any particular business. Testimonials show that the system is giving satisfaction to manufacturers, Hardware firms and others.

MEMORANDA.

The A. C. Barler Mfg. Company, 104 and 106 Lake street, Chicago, are best known to the trade as manufacturers of the Ideal Oil Heater. They are, however, very enterprising and do not confine their attention to one product. We have just received from them a very artistically embellished "post card" calling attention to their Safety Document File, which is ingeniously designed to meet a busy man's needs. It consists of a japanned steel case or box, made in two parts hinged together. In the upper part or lid is a receptacle for arranging documents so as to be conveniently accessible, this receptacle containing from 24 to 50 pockets, according to the size of the case. When closed, it is safely locked, two steel keys being furnished with each case. It takes up very little space, the smallest size being 3 x 5¼ x 11 inches, and the largest 7½ x 5¼ x 11 inches. The company are doing a good business. Last week they shipped 40 Ideal Oil Heaters to Smyrna, the letter containing the order having required 18 days to reach them. They recently sent 50 Heaters and 510 Document Files to London and also shipped ten Stoves each to Kobe and Yokohama, Japan, while a retail merchant in France, who bought one last year, has ordered another.

Fred. Tettenborn of Tettenborn & Co., Cincinnati, Ohio, in speaking of the condition of trade, states that they are doing more business now than at any time within the past three years. He says he looks for a year of continued prosperity because money is finding its way into the hands of the masses and there is a general awakening of the people.

At a meeting of the Stove dealers of Washington, D. C., held on the evening of October 20, at 1220 H street, N. W., an organization was formed, known as the Stove Dealers' Protective Association, with R. M. Harrover as president and Mr. Febrey of the firm of B. F. Guy & Co. as secretary. Another meeting will be held on Monday, November 1.

The Eckles Company of Decatur, Ill., are said to be building one of the largest portable bake ovens in the city. It is made of Russia iron lined with asbestos and is 30 inches deep and 60 inches high. It will hold over 75 loaves of bread, and is being put up for the Wilbur Bakery.

George Sykes, who has been for a number of years in the employ of A. M. Parmenter, has opened a tin shop at the corner of Main and Broad streets, Knoxville, Ill. Mr. Sykes has had over 30 years' experience at his trade, and has done some large work in the locality where he has established himself.

H. A. Hatch & Co. have opened their new store in the Miuton Block, Forest Hills, Mass., where they carry a fine line of Stoves, Ranges, Furnaces, Steam and Hot Water Heaters, &c. Tin aud sheet iron work in all its branches is given attention, and the firm will also attend to plumbing and sheet metal work. Messrs. Hatch & Co. are agents for the Boynton Steam and Hot Water Heaters.

The retail men in Brockton, Mass., who make it a part of their business to store Stoves during the warm months have been working overtime recently in delivering Coal Stoves to their customers. It is about this season of the year that many of the dealers declare that they will never store Stoves again on account of the trouble and annoyance incident thereto.

Paxton Hardware Mfg. Company, Paxton, Ill., are running their factory 12 hours a day to keep up with orders for their Roasters and Bakers. They state that they are now sole manufacturers of the Oriental Tea and Coffee Pot under contract with the Oriental Tea & Coffee Pot Company. There is said to be a large demand for this Tea and Coffee Pot throughout the West and orders are referred to as coming in freely.

The Wagner Mfg. Company, Sidney, Ohio, manufacturers of Iron and Aluminum Hollow Ware, have purchased for $40,000 the plant of the Sidney Hollow Ware Company, at that place. The two works will be run under the management of W. H. Wagner, president of the Wagner Mfg. Company.

The Carleton Mfg. Company, Sullivan, Maine, have organized for the manufacture and sale of Tinware, Pails, &c., with a capital stock of $10,000. E. B. Colcord is president of the concern.

A little slip used in the envelopes of Keen & Hagerty, Baltimore, Md., calls attention to their S. & B. "Strongest and Best" Galvanized Corrugated Washtubs on one side and on the other to the improved Maryland Oil Tank, designed for the use of those who retail kerosene or other oils. It is equipped with a pumping device, funnels and a set of measures. The Tank is made of galvanized sheet steel with a body corrugated, and also the bottom, to add to the strength. The bottom is also reinforced by strong wrought iron bands.

P. H. Kiernan informs us of the removal of his tinning and plumbing shop to 10 State street, West, Savannah, Ga., where he is making a specialty of the Royal Manhattan Range and the Cotton Plant Cook.

Olsness & Aslakson have recently opened a store in Sheyenne, N. D. Their stock comprises Hardware, Stoves, Tinware, Sporting Goods, &c.

W. T. Pace, Franklin, Va., has built a new warehouse for the accommodation of his stock of Hardware, Stoves, Tinware, Agricultural Implements, Steam Fittings, &c. He has also enlarged his office facilities, and added Building Materials to his line of goods.

Walter T. Cassells of Cassells & Co., Buenos Ayres, Argentine Republic, is in New York, making purchases of House Furnishing Goods, Stoves, Enameled Ware and kindred goods. This house import most of their supplies from America. Mr. Cassells has been in this country about a month, and will return to South America October 23.

Wilson Brothers, dealers in Hardware, Stoves, Tinware, &c., Roswell, N. M., are erecting a new store and warehouse, 25 x 150 feet. They refer to the present condition of business as better than at any time during the past three years with very encouraging prospects.

J. F. Ochsner, Nauvoo, Ill., dealer in Hardware, Implements, Stoves, &c., is erecting a new building, 50 feet wide by 100 feet in length, three stories high with 14-foot ceilings. The front will be pressed brick and stone. The cost of the building is estimated at $7000 to $9000.

M. Conner & Son, Plymouth, Mich., made an exhibit at a local fair this fall which was nicely arranged, showing a variety of goods and attracting considerable attention. The back and sides of the space were covered, and displayed samples of Mechanics' Tools, Brushes, Tinware, &c. In front was a showcase upon a counter containing a variety of small articles. Upon either side of the case were Heating Stoves. Over head large Oil Cloth patterns were looped, following the upward slant of the roof of the building.

Newell & Hewitt, Hardware, Plumbing, Roofing, &c., Punxsutawney, Pa., have been succeeded by Hewitt & Johnson.

Matthai, Ingram Company, Baltimore, Md., and 79 Beekman street, New York, are putting out a new cold handle stove lifter made of one piece of metal, with round hollow handle ⅞ inch in diameter, strengthened on the lower half by two longitudinal ribs or corrugations. They are made in three finishes, all one size—viz., black, retinned and blue enameled, numbered 5, 10 and 15, at $1.75, $2.60 and $4.25 per gross, respectively.

F. H. Stoltze has opened a retail Hardware, Tinware, Stove and Furniture store at Larimore, N. D.

STOVE TRADE NOTES.

The Lost Chord, or the Speech That Was Never Spoken.

There is an old saying to the effect that silence is golden and speech is silvern, but a startling exception to prove the truth of the time honored adage has been brought to our notice by ex-President Kahn of the National Association of Stove Manufacturers, who has rescued from oblivion the following address which Henry Gleason did not deliver before the gentlemen of the stove convention at Detroit last May:

I received a letter from President Kahn a few days since which said, "Henry, we shall expect you to respond to a toast or make a short speech." He very generously reminded me that my previous efforts had only been humorous. "A little nonsense now and then was relished." The present condition of business was serious and he requested me to dish up something substantial—if I could show a cloud with a silver lining, or a gilt edge, to do it.

His pessimistic letter, brethren, prompted me to write a sermon and I have taken for my text:

"What shall it profit a man if he manufactures all the stoves in the world and loses his only dollar? Or what can a man get in exchange if he desires to sell his foundry?"

You should all be thankful you are alive—to be present to enjoy the annual symposium of the stove men. One who can go through the fiery furnace of business reverses of the past two years need have no fear of the hereafter. Running a stove foundry only three days a week will make a salamander of the best of us. Men do more in this, the nineteenth century, for honor and place than for profit. So, with the man who makes all the stoves in the world without profit, he must do it for honor and glory—the credit, the good fortune, the dignity, the delight, the happiness, the pleasure and the gratification of having made all the stoves in the world—and this will more than compensate him for the loss of his only dollar. At the banquet given by Eve in the Garden of Eden to Adam she had no chance to steel a range or she would have sliced up the apple and served it in a pie, and what would it profit Eve could she have selected a Garland, Peninsular, Acorn or Detroit Best, or found a range with an indicator on the oven door to amuse the cook, or selected from all the world's productions, and still lost her inheritance to the Garden, just the same as you lose your last dollar?

Gentlemen, what you need is a Health Board. I can name a few men who have had the air tight, oak, steel range and other fevers and still lived, yet lost their only dollar. My brethren, "many are called, but few are chosen," so but few make a great success of any specialty. The most serious epidemic is the hot tamale, or sheet iron stove, now being made in every cross road tin shop, and many will not only lose their last dollar, but cents. And you would still be happy and say "Life is worth living" were it not for the annual visit of the stove knob fiend, who offers to give you the knobs and send a man to screw them on, or the artful genius who induces you to buy a stove urn large enough for a church steeple and arms spreading like a lobster, which costs more than the profit on your castings—and you lose your only dollar. I am reminded of the last sentence in Brother Kahn's letter: "Gleason, make it short."

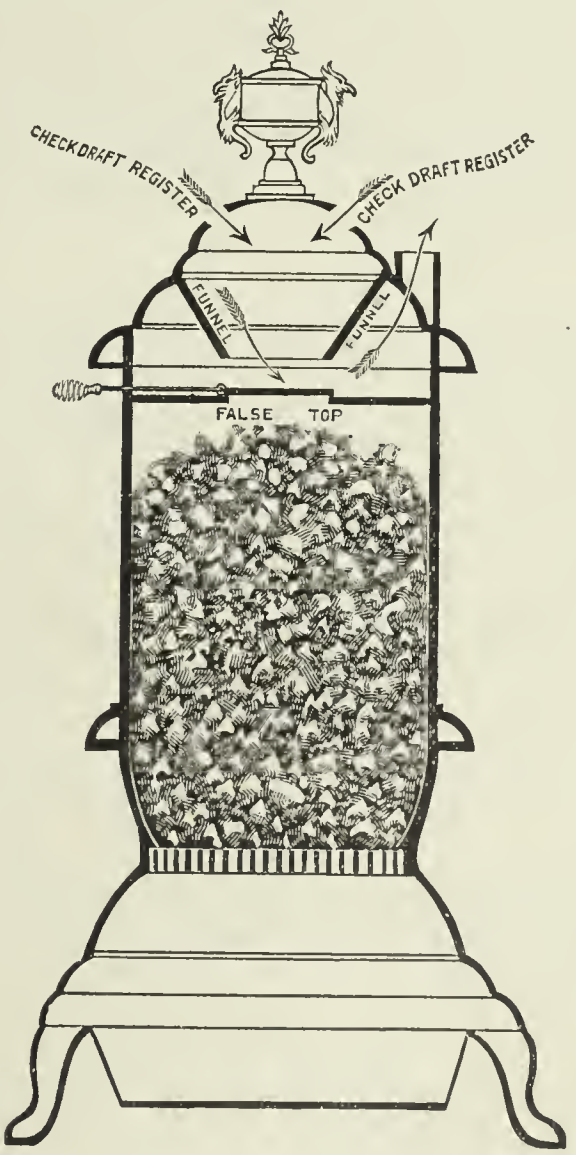
Michigan Stove Company's Export Trade.

Speaking in regard to their foreign trade, George H. Barbour, vice-president of the Michigan Stove Company, Detroit, Mich., says in an interview with the representative of a local paper:

We have had some foreign trade for many years, but have given it more attention lately. We found England a poor market. The English would buy a few American stoves, and then steal the patterns and make a clumsy imitation of our stoves for themselves. They are now using stoves made in England after the American patterns of four or five years ago. The Germans are much better customers, but we have had some difficulty there on account of their tariff regulations. We lost an excellent customer at Frankfort-on-the-Main through these regulations. They have there one duty on plain iron and another on iron that is nickel plated. They were not content at that port to unpack one stove out of a load, and levy the duty on all the rest at the same rate, but insisted that every stove in the consignment, though they were all alike, should be uncrated and inspected. As the stoves were very carefully crated for shipment, it was a good deal of a task to take off the crating and then repack them, and our customer, through whom we were building up a good trade, gave it up on that account. Our last foreign shipment was to Africa, and I was rather astonished at the high grade of goods that was demanded for that market. We have paid considerable attention to the Argentine market, but as they use chiefly gas and oil stoves we are not getting the trade there that we anticipated. But in spite of the drawbacks mentioned we are doing a fair business in foreign countries and expect to increase it.

The Special Retort Oak.

A sectional cut is herewith presented, showing the inner construction of the New Special Retort oak stove, manufactured by the Marion Stove Company, Marion,



Sectional View of the Special Retort Oak Stove.

Ind. It has no doors, fuel being fed at the top. The following description of the stove is furnished by the company:

In order to get the construction of the Special Retort Oak fairly before the reader it will be necessary to first give the motive for its construction. For years we have contended that there was practically no difference in the value of the different fuels—anthracite and bituminous coals, coke and wood—except their price in the market. Heretofore it has been impossible to reach any satisfactory conclusion, because there was no construction capable of properly burning all these different fuels, and it became necessary to invent a special construction for the

purpose. In order that the best results might be obtained, what is known as the slow combustion principle was adopted, and slow combustion could only be obtained by a systematic repression of combustion. In order to attain this end it was absolutely necessary that the shell or body of the stove should be absolutely air and gas tight.

The necessity of draft for the promotion of combustion is apparent to every one, and in order to obtain this a grate was placed in the lower part of the shell, the grate having a dump and shaking center, with the anti-clinker principle applied. By this means a grate was provided that could be cleaned without disturbing any of the fuel in the stove. About 3 inches below the top of the shell is placed a false top, or diaphragm, fitting the shell tightly, and in the center of this diaphragm is an opening for the introduction of fuel. In order that perfect control of the fire might be had, a sliding damper was placed on the upper side for the purpose of regulating the size of the central opening in the diaphragm. This damper is peculiar in that it has the front edge cut away in such a manner that the opening can never be entirely closed. Above this diaphragm, and registering with this central opening, is placed a funnel, for the double purpose of conducting the fuel through the diaphragm into the combustion chamber and also to serve as a regulator for the draft. This funnel is covered by the swing top of the stove, which top contains a register, operated by means of a lever extending through the front edge. This register is for the purpose of checking the draft and assisting in the control of the fire. It will be observed that the stove is made in the usual form of the oak, with cast iron base and fire pot, surmounted by a heavy steel body and the usual oak stove top. It will also be observed that the stove has no doors, experience having shown that a door to a stove is unnecessary and an expense, and that 90 per cent. of all the dirt made in the use of stoves is caused by the opening and closing of the doors in the admission of fuel. In this particular lies the great novelty of this construction, it being absolutely air tight between the grate and diaphragm, which of necessity it must be if the slow combustion principle is to be applied, which is but another name for suppression. Fire has been carried in this stove seven days on 58 pounds slack and a fairly good fire maintained.

Richmond Stove Company.

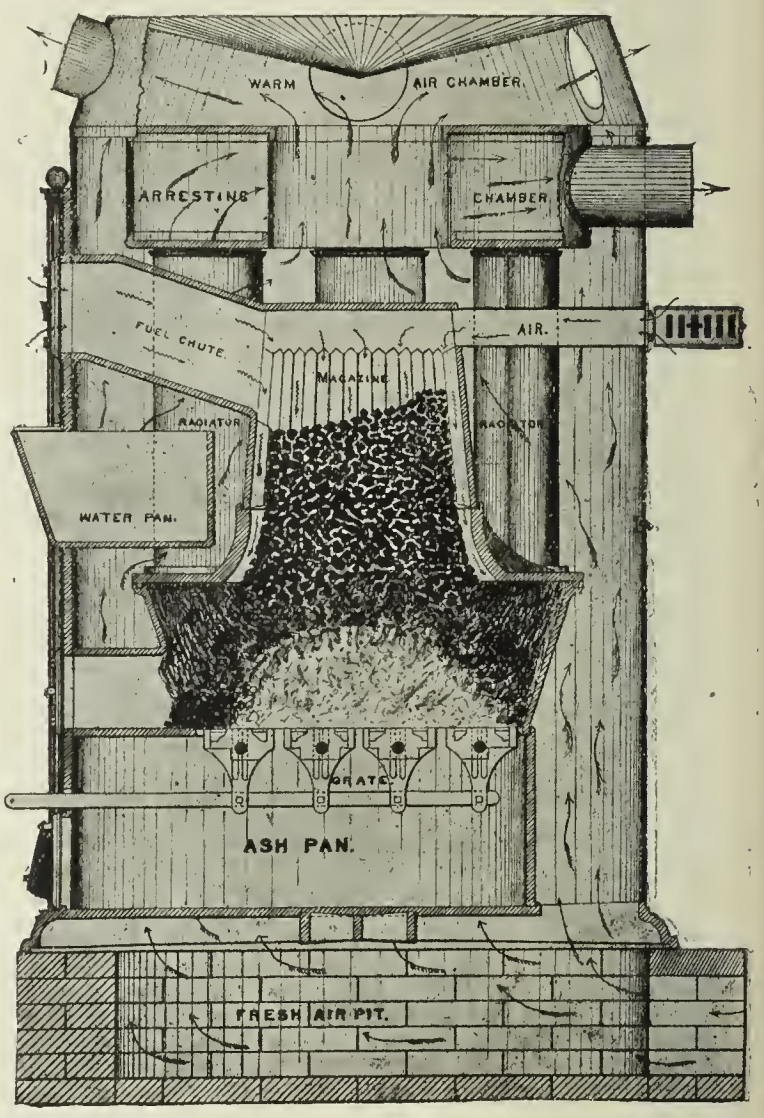
The Richmond goods form the basis of some very attractive literature which is being distributed in the shape of several pamphlets by the Richmond Stove Company of Norwich, Conn. The printing is in two colors on heavy paper, and the covers carry the word "Richmond" in script type. The first of the pamphlets is devoted to Series 1, 2 and 3 of Richmond ranges, in the production of which the manufacturers state they have spared neither time nor expense. In fact, they have put into the construction of this range "the accumulated knowledge of 30 years' experience" and proclaim it "a master piece among range constructions." The range is made in three sizes and 24 styles for hard or soft coal or wood. It has large oven, and it is stated that owing to the system of ventilation employed all objectionable odors are drawn into the flue and carried off. Another important advantage of ventilation which is referred to is in retaining the natural moisture of the air within the oven, thus preventing the drying up and wasting of nutritious juices during the process of baking or roasting. The fire box is of unusual capacity and is lined with Dighton Rock fire brick. The range has a double flue and the parts are so arranged that the products of combustion pass twice around the oven. The range is shown in several varieties, and there are presented illustrations of Cooper's oven thermometer, which is used in connection with the Richmond ranges, and of the grate employed, together with directions for using. One page of the pamphlet is devoted to a price list and another tells the story of the Richmond range. The second pamphlet deals with Series 33-45 of the Richmond range, which is referred to as entirely modern in its equipment and as thoroughly and scientifically built, as the name Richmond warrants. The third pamphlet describes Series 173-194 of the Richmond range, which is shown in several of the varieties in which it is offered.

Fine Molding Work.

Stove foundries would have been greatly interested in an exhibition of castings made by C. A. Truesdale, superintendent of Wm. Resor & Co.'s stove works, at Cincinnati, on the 20th inst. They were shown to the Western Foundrymen's Association, then in session, to illustrate how perfectly their castings could be made with no other facing than the silica sand used in the mold. Finely carved work was shown gated on the face, but with no gate marks visible, or only to be detected on the very closest scrutiny. Perfectly true stove lids were among the specimens, which had been tripod gated. Portrait medallions and other art work were also gated on the face, but no gate marks were to be seen, while the fine lines were wonderfully sharp—in fact, as sharp as if filed after cleaning. The special sand used in molding those castings is known as Dresden silica sand and comes from a deposit 60 miles south of Louisville, Ky.

The Faurot Economic Furnace.

In the accompanying illustration we show a sectional view of the Faurot Economic furnace, manufactured by the Faurot Mfg. Company, 112 West Sixth street, Kansas City, Mo. This furnace is provided with the usual ash pit and labor saving grate and is arranged to receive a supply of air from out of doors. The upper portions of the furnace are of special construction, which, it is claimed, enables it to burn soft coal with the same results as are obtained from the use of hard coal in other furnaces. The feed chute serves a double purpose in supplying the furnace with fuel and air. It is pointed out that the air in entering the furnace meets the gases that are generated by combustion and carries them down through the fire, where they ignite and secure a combustion preventing the generation of black smoke and soot, so that the furnace may be understood to work on the down draft principle.



The Faurot Economic Furnace.

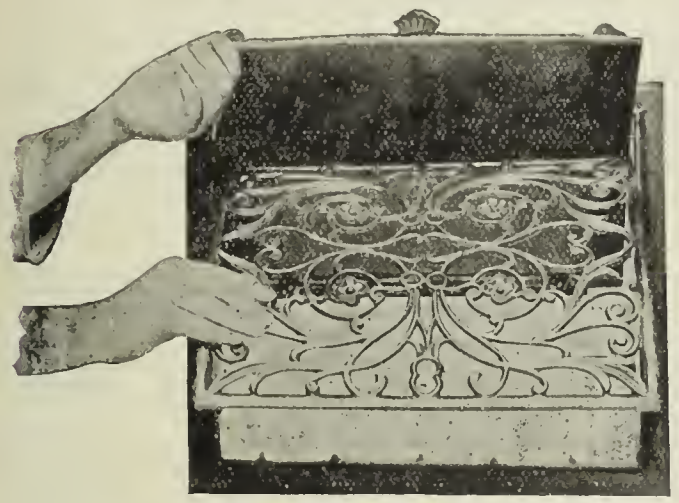
The products of combustion on leaving the fire pass through a series of round radiators to a circular drum, from which they find exit to the chimney. It is pointed out that this down draft and indirect travel insure the heating of a large surface with which the air is brought in contact in passing through the furnace. The ash pit door is made without draft slides and is only used for the removal of ashes. Just above the ash pit door is a clean out door through which any refuse may be removed from the fire that is not readily disposed of by the labor saving grate provided. The furnace is also made as a combination heater with a capacity of heating from 150 to 500 square feet of radiation. The furnaces are made in several sizes adapted for buildings of different sizes.

The item recently published concerning the new steam plant installed in the Round Oak Stove Works of the estate of P. D. Beckwith, at Dowagiac, Mich., needs some slight corrections and additions. The engine is a heavy duty cross compound condensing engine of 500 horsepower capacity, built by the E. P. Allis Company of Milwaukee, Wis. Babcock & Wilcox boilers were put in as stated, and it is believed that the power plant thus equipped has no superior in the country, from the stand-

point of economy of fuel. The works had outgrown the old engine and boilers, so that putting in the new power appliances was absolutely necessary to enable the largely increasing business to be properly handled.

Clear's Convex Cleanable Registers.

Charles Clear, Jr., 721 Pine street, St. Louis, Mo., is putting on the market a register that he claims has special features which should interest the trade. The face is detachable and made convex, so that the register frame does not necessarily extend back into the flue to reduce its size,



Clear's Convex Cleanable Registers.—Fig. 1.—*The Method of Adjusting*

and hence is particularly adapted for use with partition flues. The register proper is made in three parts, the frame, the ornamental grill forming the face plate and the shield or hood. In Fig. 1 the register is shown and the method of adjusting it. In Fig. 2 the register is shown adjusted as in use. In order to change the location of the shield or hood it is necessary to first lift the grill, and when adjusted the grill falls in place and locks the hood in position at whatever angle desired. During the summer season or at times when it is desirable to close the register entirely, by raising the grill and releasing the hood the hood can be drawn through the frame and dropped down in front of the register grill, entirely closing it, the back of the hood being ornamented so as to present a pleasing appearance. These registers are adjusted to fit wall pipes

Fig. 2 —*Adjusted as in Use.*

from 3 to 6 inches deep and from 8 to 14 inches wide. The register can be attached to the hot air flue very easily and with little labor. The registers are made in several sizes and finished in japan, bronze, nickel plate, and are also made in solid bronze and solid aluminum. Another feature of the register is the ease with which the parts of the register may be taken out to enable them to be cleaned.

The new club house of the Indiana Club, at South Bend, Ind., was recently opened for the use of its members. The building is heated by two Kelsey Hot Air Furnaces, with a system of heating designed by Irving A. Sibley, the plumbing being done by H. P. Blair & Co.

ODD PLATES.

Stanhope Boal, vice-president of the Favorite Stove & Range Company, Piqua, Ohio, in speaking of the situation and the outlook for the Stove trade says in an interview with a representative of a Cincinnati paper : "Business has improved with us, and we consider the future at present very much brighter than it has been at any time for two or three years. We have been running our works full all the year and expect to continue doing so. The enormous crops and good prices they are bringing, together with the confidence existing in financial circles, make the situation more favorable than it has been for a long time."

The Scranton Stove Works, Scranton, Pa., were reminded very forcibly of the disaster on the Hudson River Railroad last Sunday by receiving a communication from one of their customers in Saranac Lake, N. Y. The letter, which inclosed a check and bill, was on the train that made the fatal plunge into the river, but was forwarded to the Scranton Stove Works after being dried from its water soaked condition. On the back of the envelope is the notice from the New York Post Office giving the cause of the delay. The envelope was not as clean as when it left the paper maker's hands, and the address of the Scranton Stove Works looked as if it had been through a copying press, otherwise there was nothing to tell of its unusual experience.

The Indianapolis Stove Company of Indianapolis, Ind., are now settled in their new quarters and the large foundry is completed, ready for active operations.

The president of the John Van Range Company of Cincinnati, Ohio, L. E. Ziegle, reports indications for a greatly improved demand for goods of their manufacture the coming season. He is led to this conclusion by reason of the large number of inquiries from all sections of the country for prices and also from interviews with a number of their customers.

The Michigan Stove Company are assisting their customers to advertise the Front Flue Oak Garland by furnishing them very artistic hangers, giving a fine representation of this Stove. These hangers consist of heavy paper, bound with brass at the top and bottom. A large cut of the Stove is shown, with the glow of the fire shining through the mica in the door. The special features of the Stove are perceived at a glance, but in order to impress its exceptional heat producing character on the observer a sectional view is given in a lower corner. The attractiveness of the hanger is enhanced by the addition of a domestic scene, two pretty children being depicted playing in front of the Stove and evidently enjoying its genial warmth. The Garland trade-mark appears in one corner of the hanger and the Michigan trade-mark in another. The various representations are appropriately colored.

Peter B. Acker, treasurer of the Union Stove Works, 70 Beekman street, New York City, expresses the following views relative to the Stove outlook : "The trade of this house is with every part of the United States, and we can say that there has been an immense improvement in the Western demand. There will be a still better state of things here next year, and we look for gradual improvement. When this is said it should be remembered that in the past three years 40 per cent. of the furnace and Stove manufacturers in this country have—mostly through necessity—gone out of business, there not having been trade enough to sustain them. We look for good business and can say that at present things are going along very nicely."

The Turner Heater Company, Bristol, Conn., advise us that their Positive Hot Air Furnace is meeting with a good sale, particularly in New England, and that it has stood every test made of it in a gratifying manner. This Heater has a number of special features which are set forth in a circular issued.

We are indebted to Charles H. Andrews & Co., 90 Canal street, Boston, Mass., managers of the New England sales department of the Reading Stove Works, Orr, Painter & Co., proprietors, Reading Pa., for a copy of the handsome catalogue issued by the concern named and reviewed at considerable length in these columns August 21 of the present year.

A representative of the Toledo *Blade* recently made a visit to the works of the Toledo Stove Company, at the corner of Smead and Grand avenues in that place, and in speaking about the condition of business J. Leonard, the secretary and treasurer, is reported to have said : "Look at those letters and telegrams just received, and you can imagine how this rot in some of the papers about there being no improvement in business makes us tired. We have had a very good trade all year ; three times as good as last year, and it is coming thicker and faster all the time. At the present time we are working full force, and our men are putting in overtime. We are turning out on an average 100 Stoves a day. The output depends upon

the kind of Stoves that are made. The small ones will run as high as 300 daily sometimes, but just now the demand is chiefly for Ranges and large Stoves. We are up to our eyes in work, and a number of our customers are telegraphing and writing us almost daily to hurry up their orders."

Edward P. Selden, secretary of the Erie City Iron Works, Erie, Pa., spent a portion of the year in Europe, and while in Amsterdam visited the public buildings which are occupied a part of the time as a palace by Her Majesty the Queen. In the throne room of the palace Mr. Selden noticed a Crown Jewel Heater, made by the Detroit Stove Works, Detroit, Mich. In a letter to the company he relates this incident of his visit, thinking that if the company were not aware of the use to which one of their Stoves had been put it would be a pleasant surprise to them.

Announcement is made that the Loewenberg & Going Company, proprietors of the Northwestern Stove Foundry, Portland, Ore., will in the future do both a jobbing and retail business. Mr. J. Loewenberg was the founder of the firm of Goldsmith & Loewenberg, but retired from active business some ten years ago. With a view, however, to fostering Portland trade in the large territory formerly under the control of the local concern, Mr. Loewenberg has again entered active business life in connection with the concern named. A full and complete line of Stoves and Ranges embracing new designs in steel Ranges and "air tights" will be carried in stock, as well as heavy lines of hollow ware, tinware, &c.

At a recent meeting of the Board of Directors of the Bridgeport Stove Works, Bridgeport, Ala., some changes were made in the management. Crawford Douglass resigned as president, being succeeded by F. R. Patterson, who since the organization of the company in 1892 had discharged the duties of secretary and treasurer. J. P. Seiter resigned as a director, his place on the Board being taken by F. R. Patterson.

In a recent interview with a representative of one of the Detroit papers, Charles E. Eames, head of the advertising department of the Detroit Stove Works, is reported to have made the following statements regarding the company's business: "We have been working night and day for three weeks past with a force of 1200 people. This is a somewhat larger force than we have employed before, but all through the hard times this concern were busy. We had a good year even last year. At the same time the demand for Jewel Stoves and Ranges is larger now than it has been in any previous year. During the past year there has been an increased demand for our goods in foreign markets. Within the past month we have made shipments to the Hawaiian Islands, South Africa, Belgium, Germany and Great Britain, and there is a steady demand for our goods in other foreign countries. Lately we received an inquiry concerning our Gas Stoves from the city of Milatore, Madras Presidency, South India. This inquiry came from a native high court pleader. Similar inquiries concerning our Gas Stoves have reached us from Italy and England. We have experienced considerable difficulty in getting transportation for our goods, but up to date have succeeded in making prompt shipments of all orders."

One of the papers at Sioux City, Iowa, speaking of the plant of what was once known as the Paris Stove Works at Leeds, states that a sort of funeral of the institution took place on the afternoon of October 9, when the contractor in charge of the destruction of the works pulled down the last remaining evidence of the plant. This was the big chimney, which stood 130 feet high and contained 140,000 bricks.

The Kentucky Stove Company of Louisville, Ky., have recently filed articles increasing their capital from $10,000 to $26,000.

C. H. Andrews & Co., managers of the New England sales department of the Reading Stove Works, Reading, Pa., have removed their offices to the Wakefield Building, 90 Canal street, and 71 Friend street, Boston, Mass.

The Yates Furnace Company, Lockport, N. Y., who were established 12 years ago under the management of Charles H. Yates, making a specialty of the Eclipse Furnace, state that there are 163 of them in that city and vicinity. In addition to the Furnace business they handle Stoves and do a tin and iron roofing business at 13 Cottage street.

The Turner Heater Company of Bristol, Conn., report that their plant is now running at its full capacity to meet the demand for their Turner and Positive Hot Air Furnaces. They have set in the city of Bristol 92 of these Furnaces and in neighboring towns they can be counted by the dozens.

In our issue of September 11 we referred to some of the city agencies appointed by the Fuller & Warren Company, Troy, N. Y., to handle their repairs. The reference to Joseph Huse & Son, Boston, Mass., gave the impression that they were limited to that city. As a matter of fact, however, they have been appointed the New England agents for the repairs of the Fuller & Warren Company, and are the sole and exclusive agents for the repairs for the territory specified. Huse & Son propose to carry in stock, as nearly as possible, a complete assortment of these repairs, and any which they may not happen to have they will order from the foundry.

The W. J. Loth Stove Company of Waynesboro, Va., are at present very busy filling orders for their specialties, prominent among which is their new sheet iron Wood Heater, known as the Magic. This Stove embraces many interesting features, and is neatly ornamented. The bottom, top and inside flues are of cast iron, and there is a cast iron feed hole cover hinged from the top so that when it is opened it stands perpendicularly and is at the same time out of the way. There is a wicket door under the bottom for cleaning out ashes, it being secured by means of wedge and lock buttons, thus making, it is claimed, a perfectly air tight joint. The body of the Stove is of polished steel lined with extra heavy sheet steel, securely fastened with bolts.

The Detroit Furnace & Heater Company of Detroit, Mich., are erecting new works to replace those recently destroyed by fire. The new plant will be of largely increased capacity, and with appliances and requirements of an up to date foundry for the manufacture of Peerless Furnaces.

The John Van Range Company, Cincinnati, Ohio, state that for the past 30 days they have been operating their works day and night to fill orders and the outlook for business the balance of the year is very promising. Several very large orders for installation in public institutions have been secured recently, while the demand for family sizes continues to be equally satisfactory. A number of additional hands have been put on.

Carlisle & Fisher, Hagerstown, Md., are heating the Academy of Music in their city by hot air, using two No. 6 Forbes Warm Air Furnaces.

The total output of nickel in 1896 was 4603 tons, of which Canada produced 1541 tons, New Caledonia 2972 tons and Norway 90 tons.

Director of the Philadelphia Museums Prof. W. P. Wilson announces the establishment of still another department, that of a laboratory. This department, which it was early expected might in time develop as a result of the museum's growth, has been at last rendered necessary by the constant and growing receipt of quantities of raw products, notably wool, silk and other textile fabrics, sent to the museum for study and analysis to determine their availability for American manufacturers. It is managed on the plans pursued abroad in similar great public museums and exhibitions, and it is claimed, and with good reason, that no other such laboratory exists in this country. Naturally enough the work of the laboratory will, as the circular shows, not be confined to textile fabrics, but will make tests of minerals of all kinds, building materials, cements and manufactured goods when presented. A schedule of charges is furnished in the circular, with full instructions as to selecting samples to be tested. The results of the testings will be certified to by the museum, will be held strictly confidential and are confidently expected to commend the workings of the museum's laboratory to American manufacturers.

The Oliver Wire Company of Pittsburgh recently broke the record for wire drawing in 24 hours. With the 24 hours ending at 6 a.m. Tuesday morning, October 26, this firm drew 1487 tons of wire, reckoned on one-hole drawing.

A queer strike recently occurred in a Western manufactory. Early in October the management of the company voluntarily announced an advance in wages of 10 per cent., to begin on the 25th. The employees were dissatisfied when they saw the date specified, and made a demand for the advance to begin two weeks earlier. They remained idle for ten days endeavoring to carry their point, when a compromise was effected fixing the date of the advance on the 18th. The workmen probably regard this as a victory, but they will have to be quite expert at figures to be able to calculate what they gained.

Workmen in Baltimore can factories are demanding an increase in wages from 15 to 20 cents per 100 cans.

The Edward Jones Tubing Company of Brooklyn, N. Y., have been incorporated, with a capital of $1800, to manufacture brass and metal tubing. The directors are Morris Salzman, Sigmund Siegelmann and Edward Jones of Brooklyn.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Wholesale prices have weakened slightly under the influence of rather freer offering and general hesitancy on the part of buyers. A fairly good business has been effected during the week, mostly with consumers and dealers, but speculative interest remains positively dull, since there is no enlivening feature here or in the foreign markets. Jobbers' prices remain firm. Straits Pig, in small lots from store, is generally quoted at 14¾c. per lb. Arrivals of Pig Tin here, so far this month, have amounted to 2240 tons.

Copper.—The stand off between buyers and sellers that has been conspicuous for some little time past remains unbroken, and wholesale values are gradually weakening under the influence of more or less accumulation of stocks at primary points. Retail business has been of moderate proportions and jobbers' quotations are rather easier. In small parcels from store, Lake Ingot is quoted at 12c. to 12¼c. per lb., Ansonia grade Casting Copper at 11c. to 11¼c.

Sheet Copper.—A fair run of orders are being received for this material, but the demand is irregular and the total hardly up to the average for the season. Manufacturers in general are not quoting for deliveries extending beyond December 31, except at a premium over the current market rates for spot and near future shipments. For small lots of Sheet Copper from stock, jobbers ask about 15c. per lb. basis.

Pig Lead.—There has been only moderate business the past week, and wholesale prices have continued rather weak. No change has been made in retail prices, however, American Pig in small jobbing parcels being quoted at 4.35c. to 4½c. per lb.

St. Louis advices are as follows: The market for Pig Lead has failed to show any signs of recovery from the recent break. Consumers are evidently anticipating a still further decline, as they refuse to interest themselves in the market at the prices ruling to-day. The speculators have sold the market short and are doing their best to drive down prices, and the present condition of the market leads consumers to the belief that they will be successful.

Lead Pipe and Sheet.—As intimated in another column, the Eastern manufacturers have made a reduction of ¼c. in the pound on these materials. Lead Pipe is now quoted at 6c. and Sheet Lead at 7c., subject to the customary discount. The consumptive demand is disappointing in this quarter, and little improvement is looked for in the balance of the year.

Spelter.—The market remains in a quiet condition, but nothing more than ordinary competition develops, and prices have remained quite steady. Consumption is of quite moderate proportions. Good Western brands, in a retail way, rule at about 4.65c. to 4¾c. per lb.

St. Louis advices are as follows: There is no change to note in Spelter. Producers are nearly all asking 4.10c., and consumers are buying in moderate quantities at this price. There does not appear to be much chance for any change in the market price of this metal during the balance of the year.

Antimony.—There has been only routine trade and prices for small parcels have remained steady on the basis of 8¼c. to 8½c. for Cookson's, 7¾c. for Hallett's and 7½c. for Japanese.

Tin Plate.—The market has been exceedingly quiet and uninteresting during the entire week. The close of the canning season and the indifference of large consumers of Tin Plate in other lines has narrowed the demand to very small proportions. At the same time, the scarcity of spot stocks, caused by the difficulty the mills still labor under in regard to their Steel supplies, has prevented any quotable decline in prices. The fact that many of the mills are supplied with enough orders to keep them busy for several months ahead is a "bull" feature of the present situation. It is said that one of the very largest concerns in the business have all their product contracted for up to the end of April. Others have orders on their books for deliveries extending beyond the middle of next year. So that with even a moderately active demand no surplus stocks of any importance seem likely to come into sight for some time to come. It is probable that the present indifference of some of the large consumers is due to the news of the large additions to the producing force now being started. They expect this radical increase in production will bring about keener competition among the makers, resulting in lower prices. But it is pointed out that most of the new mills are not likely to be in operation and turning out goods for the market before the middle, or perhaps the second half, of next year. They would not, in consequence, cut any material figure in the 1898 market. Moreover, it is a debatable point whether the capacity of the American mills is, at the present time, quite equal to the home demand. With the increase in consumption expected next year there would seem to be room, therefore, for quite a few more mills in the industry. The retail trade has been comparatively tame the past week, especially in the line of Roofing Plates. Quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows: American Coke Tins IC, 108 lbs, 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs, $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates have been very quiet and prices are without change.

Chicago advices are as follows: A singular state of affairs obtains in this branch. Consumers and jobbers cannot get satisfactory shipments from the mills, which are crowded with orders, yet prices are not strong.

A special London cable dispatch of October 27, 1897, reports on the British Tin Plate market as follows: Tin Plate for prompt delivery continues in light demand, but makers are fairly booked and not pressing sales. Concessions in wages are not affecting prices at the moment, but buyers hold off in expectation of lower figures and refuse to contract for forward delivery. Any advantage that there might be in the reduction of workmen's wages is counteracted, however, by dearer prices for Tin Plate Bars. The Tin Plate Workers' Union has decided to accept 15 per cent. reduction off the '74 list, commencing November 1. The stocks at shipping ports have increased to 164,000 boxes.

Sheet Iron.—Business is quite active in this line and mills are busy, especially on orders for Thin Sheets. Prompt shipments are difficult to get and prices are rather higher. It is said that fully 90 per cent. of the Black Sheet manufacturers have signified their intention to maintain the prices agreed upon at the meeting held in Pittsburgh on October 7, and several of the largest mills state that they have entered within the last week quite a number of orders based on those prices. The demand for Galvanized Sheets, while not so good relatively as for Black Sheets, is referred to as active. Jobbers' prices in this section for small quantities are quoted at 2.35c. to 2.40c. per lb. for No. 27 Common Black Iron and 75 and 10 and 5 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: A much better business is doing in Black Sheets than in Galvanized. A number of large consumers appear to have estimated their requirements below their actual needs and are purchasing additional quantities. On No. 28 the manufacturers are experiencing some little competition from the Tin Plate mills. The manufacturers of Galvanized Sheets are full of work. Small lots from stock are selling at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—The market is rather more quiet, the demand not being as brisk as it was last week. Prices, however, are well maintained. Dealers in this city and vicinity pay about the following rates for moderate sized lots, delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¼c.
Light Brass	per lb. 4¼c.
Lead	per lb. 3¼c.
Tea Lead	per lb. 2¾c.
Zinc	per lb. 2 c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10.00 to $10 50
Heavy Cast Scrap, per gross ton	$9.00 to 9.50
Stove Plate Scrap, per gross ton	5.50
Burnt Iron, per gross ton	4.50

THE IRON MARKET.

The past week has been an uneventful one so far as the cruder materials, Pig Iron and Steel, are concerned. The salient fact is that the active furnaces, Steel works and rolling mills are crowded for deliveries, which proves that current consumption is heavy. It is the fear that it may possibly decrease as we draw near the close of the year which is causing some uneasiness to those with whom the experience of former winter seasons is still fresh.

Telling against this influence is, first, the very comfortable situation in which sellers find themselves now. Any efforts to market product for distant delivery meet the danger that cost of production will probably show an advancing tendency. Even now Connellsville Coke has sold for this year's delivery at $1.75.

In the Central West the drought in the Connellsville Coke region is beginning to cause some uneasiness, since it may very seriously affect the Coke supply if it continues.

In the Wire trade there are indications that the season is drawing to a close, and prices are weaker. The export trade is quiet.

Pig Iron.—The market in New York has been very quiet during the past week, but remains steady. Some round lots of Warrants have been offered at concessions. There have been reports that the agreement of the Eastern Pig Iron makers is not being lived up to strictly in all cases. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $11 to $11.25; No. 2, $10.50 to $10.75; No. 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

In the Philadelphia market for Pig Iron business is not as active as it was earlier in the month, but furnaces are well sold ahead, and as the Iron is promptly taken there is a feeling of confidence in values that is very reassuring. So far as known, no Iron can be bought for less than the inside quotations of the past two weeks, while sales at 25c. better are not at all exceptional. As regards new business, it cannot be said that there is a heavy demand, but it is a long time since deliveries were called for with such urgency as they are to-day. The situation must therefore be regarded as unusually favorable, and unless something very unforeseen occurs prices are not likely to go much if anything below their present level. General quotations for seaboard deliveries are about as follows, with the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.50; No. 2 X Foundry, $11.25 to $11.75; No. 2 Plain, $10.75 to $11.

Only a moderate demand is reported by the local producers of Pig Iron in the Chicago district, but it keeps the furnaces busy to supply it. Sales are mainly of small quantities, the largest contract recently taken calling for 1000 tons, yet the aggregate of the week's business is reported fully up to the shipments. The demand comes from all classes of foundries. Southern Iron, on the contrary, is much quieter. Sales are far apart and inquiries have lately been very few. The furnace companies, however, are reported to be well sold up and the lack of demand from this locality is not expected to result in any weakness of prices. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

The demand for Pig Iron generally in the Pittsburgh market is quiet. Bessemer Pig is a shade higher and Foundry Irons are in better demand. Quotations are as follows, f.o.b. cars Pittsburgh: No. 1 Foundry, $11 to $11.25; No. 2, Foundry, $10.50 to $10.75; No. 3 Foundry, $10 to $10.25; Bessemer, $10.40 to $10.50.

Things have taken an easy and quiet course in the Cincinnati Pig Iron market during the past week. Large deals have been very scarce, and while there has been a moderate number of small orders yet the tonnage has been light. Consumers, however, are all active and an increasing amount of Iron is being melted. There are but few who now expect another buying movement in Pig Iron circles before December, for nearly all buyers, especially the larger ones, are well supplied for the remainder of the present year. Prices are about as they were a week ago. Furnaces generally hold to the outside quotations quite firmly. There is still some warrant Iron and an occasional offering by some furnace in need of cash at the inside figures. On the whole, the market closes unchanged and firm. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The Pig Iron market in St. Louis has been quiet during the past week. Sales that have been made were mostly confined to warrant Iron, which is being offered at about 25c. per ton less than regular brands. Prices are being firmly maintained by furnaces, who show no disposition to shade prices to secure business. Stocks on the furnace banks continue to show a steady decline, which in the case of the largest Southern producers will amount to nearly 30 per cent. decrease in the past 30 days, with sufficient orders on their books to take care of their output during the next six months. The market is in excellent condition, and if present prices are maintained until the turn of the year it seems almost a certainty that higher prices will prevail after that time. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.50 to $11.00
Southern, No. 2 Foundry	10.25 to 10.50
Southern, No. 3 Foundry	10.00 to 10.25
No. 1 Soft	10.25 to 10.50
No. 2 Soft	10.00 to 10.25

CHICAGO REPORT.

Scrap.—The demand for all kinds of old material is very good. More rolling mills are starting in the West, which will largely increase the consumption. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$7.50	....
Machinery Cast	7.00	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.00	....
Old Boilers (Iron)—cut in single Sheets and Rings	7.00	....
Old Gas Pipe and Boiler Tubes	6.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	9.50	....
Copper Wire and Heavy	....	10 c.
Copper Bottoms	....	9 c.
Copper Clips	....	9¾c.
Red Brass	....	8 c.
Yellow Brass	....	7 c.
Light Brass	....	4 c.
Pipe Lead	....	3.60c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	¾c.

Anthracite.—A heavier trade is doing with trans-Mississippi points than nearer at home. The mildness of the weather has served to make business unusually backward for the season. The price on carload lots of 12 tons minimum is now as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

The contract has been placed for the large new trade school to be built for the Baron de Hirsch Fund at Sixty-fourth street and Third avenue, New York City.

THE HARDWARE TRADE.

The advance of the season and the advent of cold weather in the West and Northwest have had the effect of stimulating trade in winter goods, and an excellent demand is reported by many of the jobbers, retailers having deferred purchasing as long as they could. The condition of things in the South makes it especially desirable that cold weather set in to check the spread of the fever, apprehension of which has interfered to some considerable extent with business. Throughout the country generally there is a fair trade in progress, but the improved conditions have not as yet affected the consumers of goods sufficiently to put them in a position to buy freely. The money realized from agricultural products, the gradual increase in the activity of factories and the enlargement of enterprise in many directions are, however, putting the working classes in a much better position than for a long time, and there is little doubt that the basis is being laid for renewed and continued prosperity. Meanwhile the demand continues fair, the jobbing houses in some sections being busily engaged with the many orders coming in to them from their travelers or direct from their customers. Manufacturers, too, unite in reporting a much more promising condition of things than they have experienced in recent years, and the trade generally are looking forward to a fair trade during the remainder of the year, in the expectation that after that there will be more marked improvement, when business men generally will reap in fuller measure the advantages resulting from existing improved conditions. In the matter of prices there is little new to report. The general range of values remains without change, some goods being a little higher and others receding somewhat. In several lines the jobbers are cutting prices somewhat more freely than of late, particularly in goods which have advanced, their purchases at lower prices than are now current enabling them to do this.

Advices from Chicago.—Shelf Hardware jobbers report perhaps a better volume of business than usual at this time of the year, but the heavy fall demand is now over and the orders being received are for small lots to stock up and for such classes of seasonable goods as are appropriate to this period. A good movement is still noted in Builders' Hardware, but the demand for staple goods, such as Wire Nails and Barb Wire, is considerably lighter than it has been. The general demand for metals is rather quiet, but quite an active movement is noted in the smaller goods in the line of Tinware. Factories are behind in their shipments of such goods, as they are unable to get Tin Plate fast enough. More full packages are now going out and the demand is running to goods of better quality. The prolonged dry weather has been beneficial to the jobbers of Heavy Hardware, as it has caused an unusual demand for Wagon and Carriage Tire, Spokes and Rims. The business of the month has been very heavy, orders still keeping up, the gains this week being as large as at any time in October.

Advices from St. Louis.—The Hardware trade continues to feel the effects of the late summer, which is prolonged to an unusual degree. The month of November is right at hand and furnace fires have not as yet been lighted. Dealers in Stoves and kindred supplies bought liberally in anticipation of a heavy demand, but as yet have had practically no business to speak of. The demand for Shelf Goods is moderately active and Heavy Hardware is also in good demand. Prices are firm and in some cases advances have been made. Galvanized Iron is now quoted at 80 and 2½ per cent. discount. Screws have advanced and Flat Head Iron Screws are now quoted at 90, 10 and 5 per cent. discount. The general trend of prices is upward, and in view of the advance in raw material a general advance throughout the entire line of finished products is in order. Collections are very satisfactory.

NOTES ON PRICES.

Wire Nails.—The demand for Wire Nails is not quite so active as it was a month ago, but the market continues to be in excellent condition, with prices quite firmly maintained by the manufacturers. Some of the jobbers, however, who purchased freely at lower prices are cutting somewhat. New York quotations are $1.70 for small lots from store.

Advices from Chicago.—Manufacturers are as firm as at any previous time this fall. Rods are still scarce and dear. Owing to the efforts of some local middlemen, however, to unload Nails which they were obliged to take this month, the market seems a trifle easier. This influence is only expected to be temporary and may be confined entirely to this immediate locality. Jobbers quote small lots from stock at $1.60 to $1.65.

Advices from St. Louis.—There is no change to note in Wire Nails. The demand is satisfactory, and prices are well maintained. Jobbers quote $1.65 to $1.70 base for small lots from store.

Cut Nails.—The market continues fairly active, with prices firmly maintained. The New York price is $1.53 for less than carload lots.

Advices from Chicago.—Not much is heard of Cut Nails in this market. Prices for small lots are continued at $1.50 to $1.55.

Advices from St. Louis.—There is a fair amount of business doing in Cut Nails. Less than carload lots command $1.55.

Barb Wire.—The Barb Wire market is quiet, with prices steady.

Advices from Chicago.—The factories are still busy on contracts which they have taken for shipment this fall, but new business is not now coming forward to any considerable extent. The demand is about over for this season. The outlook for the spring trade is pronounced on all sides to be exceedingly satisfactory. Small lots from stock sell at $1.60 for Painted and $1.90 for Galvanized.

Advices from St. Louis.—There has been a steady falling off in the demand for Barb Wire, and as the dull season is rapidly approaching mills do not anticipate a revival of trade until the spring demand sets in. Jobbers quote small lots of Painted at $1.65 to $1.70, with the usual advance for Galvanized.

Smooth Wire.—There is no change of importance in the market for Smooth Wire. A fair but not especially heavy volume of business is reported.

Lead Pipe and Sheet Lead.—Under date October 22 the following revised prices on Lead Pipe and Sheet Lead are announced, which are subject to the usual discount of 20 per cent.:

Lead Pipe	per lb., 6 cents.
Sheet Lead	" 7 "

Wrought Iron Pipe.—The arrangement between the manufacturers of Wrought Iron Pipe is working satisfactorily, and prices are quite steady on the new basis. The policy recently adopted by the manufacturers of giving delivery on carload lots and making less than carload lots f.o.b. factory is referred to as working satisfactorily and giving the large trade more protection on this line. The volume of business is fair, but not especially heavy. The base prices are as follows: Butt Welded Black, 72 per cent.; Butt Welded Galvanized, 67 per cent.; Lap Welded Black, 78 per cent.; Lap Welded Galvanized, 70 per cent.

Registers.—There continues to be some confusion in the trade owing to the fact that some of the manufacturers are using the old and some the new list on Registers. There is also considerable diversity in the prices at which the goods are sold.

Tacks.—The Tack market is characterized by a somewhat firmer tone, some of the manufacturers having either announced higher prices or withdrawn outstanding quotations. The advance in the raw material and the increased demand are reasons for this action. There is, however, a good deal of unevenness in the market, and the quotations of the different manufacturers on similar goods in many cases vary widely.

Sheet Aluminum.—The November price-list of the Pittsburgh Reduction Company, Pittsburgh, Pa., shows a reduction in the price of the heavier gauges of Sheet Aluminum from No. 19 to No. 13 gauge, wider than 6 inches and including 14 inches, from 40 cents per pound to 38 cents per pound. All the other prices remain as given in the new list published on page 86 of *The Metal Worker* of October 16, 1897. It is pointed out that the present reduction brings the cost of Sheet Aluminum below the cost of Sheet Brass of similar size and gauge.

Carriage Bolts, Machine Bolts, &c.—An advance of about 5 per cent. has been announced by most of the manufacturers of Carriage Bolts, Machine Bolts, Lag Screws, &c. This is referred to as necessary on account of the increased cost of the raw material. While there is no formal agreement between the manufacturers in regard to prices, most of them are working harmoniously, and the market is thus in a better condition than it was a short time ago. There is, however, still some irregularity in prices.

Nuts.—At a conference of some of the manufacturers of Hot Pressed Nuts held last week it was decided to make an advance of 1-10 cent per pound. No change was made in price of Cold Punched Nuts.

Glass.—Jobbers have received no notification of the new association—the American Glass Company—being in operation, nor have any new price-list or discounts gone into effect. It is therefore safe to assume that the details

have not all been perfected and that the single association is not yet in working order. Chicago jobbers have recently advanced prices 5 per cent., and another advance will go into effect, it is understood, November 1. A committee has also been appointed to arrange, if possible, a temporary consolidation of all the jobbers' stocks, to be distributed by one selling agent in such a way as to supply the most urgent needs of consumers. If this deal is carried into effect it will, of course, do away with competition and insure the best price obtainable. New York jobbers' stocks are well assorted, not having been depleted because of the lack of demand. The nominal quotation on American Glass is 60 and 10 and 5, and on French—from the new list—80 and 20 per cent. Competition and desire for business result in concessions from these prices being made.

White Lead.—There has been about the ordinary distribution of White Lead and by-products, and despite the unsettled condition of the market for base material corroders have made no changes in their list prices or terms. There is still some indirect swerving on the part of jobbers, however, and ordinary small orders are being taken at almost the net price made officially for large lots.

Linseed Oil.—Prices have been very steady throughout the week, and the market is without really new feature. Crushers are more than usually conservative, owing to the condition of the Seed market, and buyers are placing orders only as immediate wants may require.

Spirits Turpentine.—Southern markets have weakened and wholesale prices are lower here in sympathy.

TRADE NOTES.

Articles of incorporation of the Safety Burner Company of Providence, R. I., have been filed at the office of the Secretary of State of Rhode Island. The company have been formed for the manufacture and sale of Lamp Burners and other articles of a similar nature and Novelties. The incorporators are Isaiah Long, Alfred S. Keach and William H. Sweetland. The amount of capital stock is stated at $50,000.

The Levi Hey Company of Rochester, N. Y., have been incorporated, with a capital stock of $40,000, to deal in Rags, Paper Stock, Iron, Steel and other metals. The directors named are Levi Hey, Ernest C. Hazard, George R. Coates and John Bennett of Rochester.

MEMORANDA.

Wilson & Co. have opened up a large Hardware store at 162 Pennsylvania avenue, Allegheny, Pa. The firm are handling Stoves, Tinware and House Furnishing Goods, and also have a steam, hot water and warm air heating and ventilation department.

Landers, Frary & Clark, New Britain, Conn., have recently enlarged their line of raisin seeders by adding the No. 3 Crown seeder, said to seed a pound of raisins in one minute. This size is designed for bakeries, hotels, clubs, restaurants and other places of similar character. A No. 4 size for family use, made on the same principle, is also offered. This is said to seed 1 pound of raisins in five minutes. The Nos. 1 and 2 Crown raisin seeders brought out last fall complete the assortment of seeders made by this company. Another comparatively new line are the Crown coffee mills, seven in number, two with cranks and five with double fly wheels, listing from $1.50 to $16 each, grinding from 6 ounces a minute to 1½ pounds in the same time.

The Knapp & Cowles Mfg. Company, Bridgeport, Conn., have lately put on the market No. 2 family cleaver, which is described as made of the best cast steel, forged, with finely polished handle and heavy steel ferrule. Its construction is referred to as insuring a perfect balance. Another article which they have recently commenced manufacturing is a magnetic tack hammer.

H. C. Strong, Port Angeles, Wash., has taken Robert D. Willson into partnership in his Hardware business. The style is now Strong & Willson. The firm have secured the store adjoining their establishment, and will put a stock of House Furnishing Goods in it. The Alaska gold excitement and the prosperity of the local farmers are mentioned as insuring a bright future for Puget Sound merchants.

W. Willet Trego has purchased the Hardware business formerly conducted by F. A. Schneider, at 1763 Pennsylvania avenue N. W., Washington, D. C., and will continue at the old stand. Mr. Trego would be pleased to receive printed matter relating to the Hardware and House Furnishing Goods lines.

Foard & Stokes Company, Astoria, Oregon, who have been in business at that point for the past 17 years, advise us that their trade has increased to such an extent that they have leased the upper story of the building they are now occupying, which will give them another floor, 50 x 75 feet. This floor will be devoted to the sample and display of their stock of Hardware, Crockery, Stoves and Tinware. An electric elevator will also be installed, which will facilitate the moving of goods from one floor to another. The company are also dealers in a full line of Ship Candlery, Paints, Oils, Wood and Willow Ware, Cannery and Fishing Supplies, &c.

Hibbard, Spencer, Bartlett & Co., Lake street and Wabash avenue, Chicago, have secured exclusive control of the output of Ajax and Alaska metallic stitched weather strip. These are two styles of metallic weather strip, but both of them are claimed to be the only ones ever produced in which the rubber is secured to the metal by teeth. These teeth number ten to the inch along the edge of the zinc strip, are punched through the rubber and are clinched on the other side. The zinc is corrugated, so that it is very stiff when tacked in position through holes punched 2½ inches apart. Both forms of the strip are put up in very attractive and convenient packages, namely, rolled in coils in lengths of 100 feet and placed in flat boxes, the end pulling out straight at a corner of the box. The method of packing makes great saving in shelf room, and is in itself sufficient to sell the goods.

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Metal and Miscellaneous Prices.

CHICAGO, OCTOBER 28, 1897.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
C, 14 x 28		$7.25
X, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
X, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
X, 14 x 56	$12.50
XX, 14 x 56	14.00
X, 14 x 60	13.50
XX, 14 x 60	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
STP L Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.90¢	2.50¢
17 to 20	2 00¢	2.60¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ℔ lb, A....$10.20 } 10%
Patent Planished, ℔ lb, B..... 9.20 } dis.
Craig's Polished Sheet Steel.....8¼¢

Galvanized.

First quality.....dis. 75&10&5@80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Slab Spelter—

Western Spelter.....4¼@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin.... ℔ square,	$4.75	$4.50
Galv..... ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20..... 8.00 square
Steel Painted, 14 x 20..... 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....℔ lb 2 ¢
" " Brown.....℔ lb 1½¢
" " Purple.....℔ lb 2½¢
" " Ground in oil, B. Red, ℔ lb 6½¢
" " Ground in oil, Red...℔ lb 6½¢
" " Ground in oil, Brown, ℔ lb 5½¢
" " Ground in oil, Purple, ℔ lb 6½¢
Linseed Oil, Boiled, in bbls.....37¢
Linseed Oil, Raw, in bbls.....35¢
Mineral Paints.....1 @ 3c
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American..... .5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans....8 ¢
kegs.3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal....35¢
Asphaltum, Trinidad Refined, ℔ ton.$45
Tarred Felt, 1 Ply, ℔ 100 lb.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl. of 300 lb... .$3.00

NEW YORK, OCTOBER 29.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 10.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.40
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8¼@8½¢
Hallett's.....₩ lb, 7¾@8¢
Japanese.....₩ lb, 7½¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.	
¾-in. up to 2-in.	$0.35	35% off.
5/8-in. up to ¾-in.	.36	
½-in. up to 5/8-in.	.38	
3/8-in. up to ½-in.	.41	
5-16-in. up to 3/8-in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3-in. and larger	Special	
2-in. to 3-in., to No. 19, inclusive.	.38	

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₩ lb, 2 00....	2.30¢
Nos. 17 to 21.....	₩ lb, 2.10....	2.40¢
Nos. 22 to 24.....	₩ lb, 2.20....	2.50¢
Nos. 25 and 26...	₩ lb, 2.30....	2.60¢
No. 27.....	₩ lb, 2.40....	2.70¢
No. 28.....	₩ lb, 2.50....	2.80¢
American B. B.....		₩ lb, 4¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb, 8½¢

Galvanized.

Nos. 10 to 16.....	₩ lb, 12¢	75&10& 5% off.
Nos. 17 to 21.....	₩ lb, 13¢	
Nos. 22 to 24.....	₩ lb, 14¢	
Nos. 25 to 26.....	₩ lb, 15¢	
No. 27.....	₩ lb, 16¢	
No. 28.....	₩ lb, 17¢	
No. 30.....	₩ lb, 19¢	
No. 30.....	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½@4¾¢
Bar.....5¢
Pipe.....6¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....7¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red, bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1¼¢
Red Venetian, American..... @1¾¢
Linseed Oil:
Raw, ₩ gal..... @38¢
Boiled..... @40¢
Spirits Turpentine:
In bbls.....34@34½¢
In cases.....42@42½¢
Putty:
In barrels and ⅛ bbls..... 1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5 ¢
Clarified.....₩ lb 4⅞¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil*, ½c. ₩ lb *higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline.....₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, 40&5%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " Extra Heavy.....75%
" " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....55%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated.....40&10%
Solid Bronze.....25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%

1896 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₩ bbl.	$1.82@	$1.83
Rosin, E. & F.....	₩ bbl.	1.84@	1.87
Rosin, G. & H.....	₩ bbl.	1.00@	1.95
Rosin, I. & K.....	₩ bbl.	2.00@	2.05
Rosin, M. & N.....	₩ bbl.	2.10@	2.25

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.....	$3.75@	$5.00
No. 1 Bangor Ribbon.....	3.35@	3.75
Pen Argyle, ₩ sqr.....	3.75@	4.35
Peach Bottom, ₩ sqr.....	4.75@	5.60
No. 1 Chapman, ₩ sqr....	3.80@	4.80
Lehigh Slates, ₩ sqr.....	3.00@	4.50

Vermont:

Sea Green, ₩ sqr.....	$2.50@	$3.55
Purple, ₩ sqr.....	3.25@	4.00
Unfading Green, ₩ sqr...	3.75@	4.50
Red, ₩ sqr.....	9.00@	11.00

Solder and Soldering Fluids— Solder—

½&½ guaranteed.....	10¾@11¢
No. 1.....	9¾@10½¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb.....4¢
(5% dis.)
Yager's Soldering Salts.
½ lb bottles, each.....80¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....15½¢@17½¢ net

Spelter—

Western Spelter.....4.65@4¾¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15½¢
Straits, pigs, lb lb.....14¾¢
Straits, in bars, ₩ lb.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20....	6.75
" "	IXXX,	14 x 20....	7.75
" "	IXXXX,	14 x 20....	8.75
" "	DC,	12½ x 17....	4.25
" "	DX,	12½ x 17....	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20...	5.75
" "	IXXX,	14 x 20...	6.50
" "	IXXXX,	14 x 20...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	10¢
95 lb	15
90 lb	20¢
85 lb	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating...	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating...	8.00 @ 9.25
STP Grade, 10 to 12 lb coating...	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....	$9.10
IXX, 14 x 28..(112 sheets).....	9.80
IXX, 14 x 31..(112 sheets).....	10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke, IC,	14 x 20.....	$4.25
	IX, 14 x 20.....	5.25

Terne Plates—

MF, IC,	14 x 20.....	$6.30
	20 x 28.....	12.60
Worcester Grade, IC,	14 x 20.....	4.25
	20 x 28.....	8.50
Dean Grade, IC,	14 x 20.....	4.00
	20 x 28.....	8.00
Gilbertson's Old Method, IC,	14 x 20..	7.50
	20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Dalsy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain.....	72%
1¼ and less, Galv.....	67%
1½ and larger, Plain.....	78%
1½ and larger, Galv.....	70%
Screw and Socket Joint Casing.....	65%
Inserted Joint Casing.....	60%
Boiler Tubes, 2¼ inch and smaller.	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

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Bangor Excelsior Slate Co... 75
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Bliss, E. W. Co..... 94
Blodgett, G. S. Co..... 18
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Boynton Furnace Co..... 22
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Bray, J. & Co..... 95
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Highton, Wm. & Sons, Boston, Mass.
Kernan Furnace Co., Utica, N. Y.
Schreiber & Conchar Mfg. Co., Dubuque, Iowa.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Roasters and Bakers.
Hill-Whitney Aluminum Co., Boston, Mass.

Roofing, Asphalt.
Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Bowers, L. M. & Co., Binghamton, N. Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Soutner, E. E. Iron Co., St. Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Ct.

Roofing Nails.
Salem Nail Co., 293 Pearl St., N. Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., East Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.
New York Trade School, First Ave. and 67th St., N. Y.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., New Haven, Conn.
Crosby, G. A & Co., Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co Brooklyn, N. Y.
Universal Machine Co., Canton, Ohio.
Watrous & Co., Troy, N. Y.
West Mfg. Co., Buffalo, N. Y.

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Sheet Metal Work.
Weltzel, J. F., Cincinnati, Ohio.

Sheets, Iron and Steel.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Staudard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N.Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.
Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co,. Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.
Laiance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Slaters' Tools.
Gait, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.
Watrous & Co., Troy, N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Stamped Ware, Aluminum.
Illinois Pure Aluminum Co., Lemont, Ill.

Statuary, Sheet Metal.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.
Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.
Adams Mfg. Co., Minneapolis, Minn.

Stove Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Berger Bros, Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.
Parks & Parks, Troy, N. Y.

Stove Putty.
Connors, Wm., Troy, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Hessler, H. E., Syracuse, N. Y.
Howes, The S. M Co., Boston, Mass.
Kieffer Bros., Syracuse, N. Y.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Morris, J. L., Chicago, Ill.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.

Stove Trucks.
Gwinner Mfg. Co., Cincinnati, O.
Howes, The S. M. Co., Boston, Mass.
Mersick, C. S. & Co., New Haven, Ct.

Stoves and Ranges.
Beckwith, P. D., Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Bussey & McLeod Stove Co., Troy, N.Y.
Champion Steel Range Co., Cleveland, Ohio.
Clad, V. & Sons, Phila., Pa.
Comstock-Castle Stove Co., Quincy, Ill.
Eclipse Stove Co., Mansfield, O.
Gem City Stove Co., Dayton, O.
Graff & Co., 208 Water St., N. Y.
Howes, The S. M. Co., Boston, Mass.
Magee Furnace Co., Boston, Mass
March-Brownback Stove Co., Pottstown, Pa.
Marion Stove Co., Marion, Ind.
Michigan Stove Co., Chicago, Ill.
Miller, Wm. Range & Furnace Co., Cincinnati, O.
Mt. Penn Stove Works, Reading, Pa.
Nohle, Chas. & Co., Phila., Pa.
Phillips & Clark Stove Co., Geneva, N. Y.
Rathbone, Sard & Co., Albany, N. Y.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schuylkill Valley Stove Co., Spring City, Pa.
Shenpard, Isaac A. & Co., Phila., Pa.
Sill Stove Works, Rochester, N. Y.
Somerset Stove Foundry Co, Somerset, Mass.
Syracuse Stove Works, Syracuse, N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Warren Hardware Co., Warren, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Bradley, Munk & Co., Columbus, O.
Reineke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Electric Oil Stove Co., Homer, Mich.
Miller, Edward Co., Meriden, Conn.
Monarch Stove Co., Mansfield, O.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., New York.
Rochester Stamping Wks., Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tea Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Tools, Machines and Supplies.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tin Plate. (*Mfrs. of.*)
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lishon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty, Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Trade Schools.
New York Trade School, First Ave. and 67th St., N. Y.

Tubing, Brass and Copper.
Randolph & Clowes, Waterbury, Conn.

Valves.
Eastwood Wire Mfg. Co., Belleville, N. J.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.
Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.
Keen & Hagerty, Baltimore, Md.

Washers, Valves, &c.
Marston, I. G. & Co., Boston, Mass.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co., 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A TINNER who can drive slate; one who can do plumbing or steam heating preferred. W. A. Gephart, St. Clairsville, Ohio. Oct. 30

A TINSMITH; to the right man we will give steady work; address, stating age, experience, nationality and wages expected. Perry, Read & Co., Hinesburgh, Vt. Oct. 30

A first-class COPPERSMITH to take charge of a shop manufacturing range boilers and other similar work; must have good habits and be able to turn out work at the lowest possible cost consistent with good workmanship. "W. H. S.", No. 1030, office of *The Metal Worker*, 232-238 William street, New York City Oct. 30

Two first-class SALESMEN to sell stoves; don't apply unless you have had two years' experience on the road; state age, experience, amount of annual sales, territory covered and salary expected. Address by mail Detroit Stove Works, Detroit, Mich. Oct. 30

A man possessing necessary qualifications to start and conduct a new department for our compauy, furnaces, steam and hot water heaters; must be competent to make or direct drawings for patterns and superintend entire department. Address by mail, stating age and giving full particulars as to your knowledge and experience, Detroit Stove Works, Detroit, Mich. Oct. 30

Three good STOVE MOUNTERS. St. Paul Stove Works, St. Paul, Minn. Oct. 30

A first-class, intelligent CUTTER for large shop in Boston; only one fully capable, and who thoroughly understands drawings, and can get out work from same, need apply. "Manufacturer," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

HEATING MAN, with knowledge of hot water, steam and fan heating; must make plans, specifications, and call on architects. "Expert." office of *The Metal Worker*, 512 Commercial Building, St. Louis, Mo. Oct. 23

A couple of good TINSMITHS on galvanized sheet iron work; state age, if married, and wages expected. "Galvanized," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

To correspond with SALESMAN visiting hardware trade who can handle a line of furnaces; splendid opportunity for right man. "Hardware Trade," office of *The Metal Worker*, 232-288 William street, New York City. Oct. 23

A good TINSMITH and JOBBER to come and locate in a live New England town. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

SITUATIONS WANTED.

Thorough master of the business in HOT WATER, STEAM and HOT AIR, both by practice and theory: I make plans, sales and good contracts; can take management of a heating department and save my salary to the house; heat and ventilate any building; expert in curing sick jobs; travel if necessary; not out of a job, but open for improvement; East or West. "Warm Business," 699 Hackett avenue, Milwaukee, Wis. Oct. 30

By a BOOK-KEEPER. 14 years' experience with one firm; 32 years of age; married; excellent reference. Wm. Sturz, 429 Pulaski street, Brooklyn, N. Y. Oct. 30.

ARCHITECTS, BUILDERS and OWNERS about to build suburban dwellings; I am prepared to submit estimates for the labor of plumbing, steam or bot water heating; I am equipped for the work, and I thoroughly understand my trade, and do the work myself; first-class references; 25 years' experience. "F. & A., office of *The Metal Worker*, 232-238 William street, New York City. Oct. 30

As DRAFTSMAN or ASSISTANT PATTERN CUTTER, by a young man who thoroughly understands drafting and has had some experience in practical pattern cutting; would take a position as assistant cutter at a low figure in order to thoroughly learn this branch of tin or sheet iron work. "D. C.," office of *The Metal Worker*, 232-238 William streot, New York City. Oct. 30

A first-class practical HEATING and VENTILATING man, capable of erecting new work in steam, hot water or furnace work; ranges and stoves; making repairs; correcting defective work, &c.; positon in this city or vicinity as workman or foreman, familiar with every detail of business; can estimate on costs, and lay out work; steady and reliable. "Heating and Ventilating," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 30

By PLUMBER of 12 years' experience, and sober and reliable; steady position solicited. Bismarck Gas Light Company, 1234 South Dover street, Philadelphia, Pa. Oct. 30

By a first-class TIN and SHEET IRON WORKER and GENERAL JOBBER, able to cut patterns; 28 years of age; sober and reliable; wages moderate; city or country. M. Bloom, 106 East Broadway, New York City. Oct. 30

By a practical, experienced TIN and SHEET IRON WORKER; 25 years' experience in cornice and skylight work; can work from plans; capable of taking charge of shop; also do dairy and blow pipe work. "A. B. C.," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 30

By a PLUMBER, GAS FITTER, TIN and SHEET IRON WORKER; good habits; 12 years' experience. John D. Abrams, Box 75 Hempstead, N. Y. Oct. 30

By a man who has had ten years' experience at general jobbing, at tinning, sheet iron, stove, heater, furnace, iron pipe, steam fitting and plumbing work; 28 years of age; sober and steady man; wages $2 per day for steady work. "Jobber," 160 Walnut street, Bloomfield. N. J Oct. 30

As SALESMAN with some good firm; 15 years' experience; can speak German and English; hard worker and good talker; will work for salary or salary and commission. "A1 Salesman," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 30

An experienced stove, furnace and gasoline stove SALESMAN, with established trade in Indiana, Michigan and Ohio, would like to correspond with some good concern relative to the season of '98. "Buckeye," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 30

By a TINSMITH, PLUMBER and HOT AIR FURNACEMAN with a good knowledge of steam and hot water; can furnish reference. "L.," Box 596, Bellows Falls, Vt. Oct. 30

PATENT OFFICE DRAFTSMAN, experienced in difficult cases and familiar with all branches of patent work, would be glad to hear from attorney or manufacturer needing such. J. F. Duhamel, Pacific Building, Washington, D. C. Oct. 30

SALESMAN would like a position in some wholesale house; am acquainted with furnaces and ranges, also plumbing materials; quick at discounts. "Stanton," 193 Second avenue, New York City. Oct. 30

By a first-class STOVE PATTERN MAKER in a pattern shop; stove and machine patterns; carving and drafting. "Patterns," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 30

Steady job by a first-class TIN and SLATE ROOFER; inside work; pipe fitting and furnace work; 29 years' experience; moderate wages. A Tinner, General Delivery, Cincinnati, Ohio. Oct. 30

As HARDWARE SALESMAN or as HELPER with a tinsmith, plumber or fitter; has had considerable experience in each line; age 24; single; strictly temperate; can furnish the best of reference. Orrin Merritt, Owego, N. Y. Oct. 30

By a young man 21 as JUNIOR PLUMBER, has also some knowledge of ranges, heaters and furnaces. Box 365, Ozone Park, L. I. Oct. 30

By a hardwareman, age 28, with ten years' experience in hardware, stoves and implements, wholesale and retail. "W. & R.," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 30

By a first-class Boston PLUMBER; can do furnace work and general jobbing, estimate on all kinds of work; have first-class references; sober, and works for interest of all concerned; state wages. Jas. A. Reber, 62 Hammond street, Boston, Mass. Oct. 30

MECHANICAL ENGINEER with extensive experience at designing and constructing light machinery and tools, and familiar with the manufacture of bicycles, builders' hardware and tinware; moderate wages and best of references. "J. D. R.," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 30

By a first-class TINSMITH and FURNACE MAKER; is also familiar with cornice work and the tinware business; good reference furnished. "Tinsmith," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Oct. 23

By a first-class STOVE PATTERN MAKER and DESIGNER; thoroughly understands the business in all the details; can do carving and mechanical drafting; an artistic and fast worker; will accept a position on trial for moderate wages. "Designer," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

By expert plater, polisher and buffer; understands brass foundry, brass finishing and pattern making; as FOREMAN of medium sized shop, or to take charge of plating and polishing department in large establishment; 22 years' experience; speaks German and English; can handle help to advantage; unquestionable references. F. A. Weber, 211 West Third street, Cincinnati, Ohio. Oct. 23

A No. 1 PLUMBER with New York license wishes responsible, permanent position. "Plumber," 401 East Eighty-sixth street, New York City. Oct. 23

By a practical foundryman as SUPERINTENDENT of a foundry; am thoroughly familiar with the manufacture of stoves and ranges and steam and hot water boilers; having 11 years' experience; understand modern cupola practice and can handle help; willing to take moderate salary until ability is proven; can furuish best of references. "Superintendent," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

PLUMBER understanding sanitary work thoroughly, also low pressure steam and water fitting, wishes to obtain steady position; married; temperate; good reference; country preferred; state wages. "B. W. J.," Red Bank, N. J. Oct. 23

By a young man in hardware store; does not known it all, but willing to work at anything to learn; two years' experience. Any one desiring first-class reference is invited to correspond with Lock Box 154, Bloomington, Ind. Oct. 23

Young man, 17, would like to learn the plumber's trade; can give good reference, both city and country. P. O. Box 66, Center Moriches, L. I. Oct. 23

By a good boy 15 years of age in a tinsmith shop; had experience at roofing, furnace and cornice work; can lay out work from plans; $6 to $7 per week desired; willing to work. John Geo. Werner, care Mrs. Messemer, 636 East 150th street, New York City. Oct. 23

By young man, 18, as first-class plumber's helper; three years' experience; would like steady position; city or country. M. Seaman, 69 Rivington street, New York Ctiy. Oct. 23

CORNICE and SKYLIGHT MAKER; first-class assistant cutter; 30 years of age. "K. L. M.," 79 Green street, Newark, N. J. Oct. 23

By a PLUMBER; can do all kinds of plumbing jobbing; am 28 years of age, single and steady; willing to work for reasonable pay. Thos. F. Burke, West Winsted, Conn. Oct. 23.

Line of legitimate hardware wanted by TRAVELING MAN of 12 years' experience, with established trade through Iowa, Minnesota and Wisconsin; A No 1 references. "K. 100," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 23

Steady position by a steady, sober TINSMITH and SHEET IRON WORKER; experienced at inside and outside work; tin roofing, iron pipe, pump work and general jobbing; wages moderate; references. "Tinsmith," care A. Oliver & Co., 173 East Ferry street, Buffalo, N. Y. Oct. 23

As FOREMAN or CUTTER in cornice shop by a first-class draftsman and cutter; can estimate on all kinds of work and handle men to good advantage. Adolf D. Klein, 247 East Seventy-seventh street, New York City. Oct. 23

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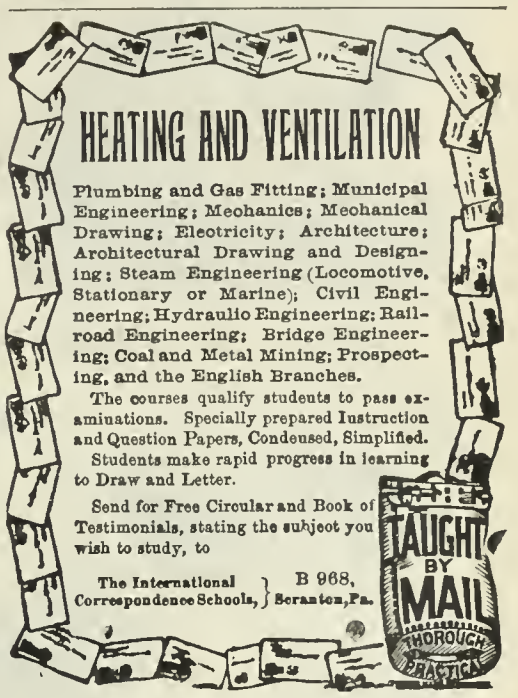
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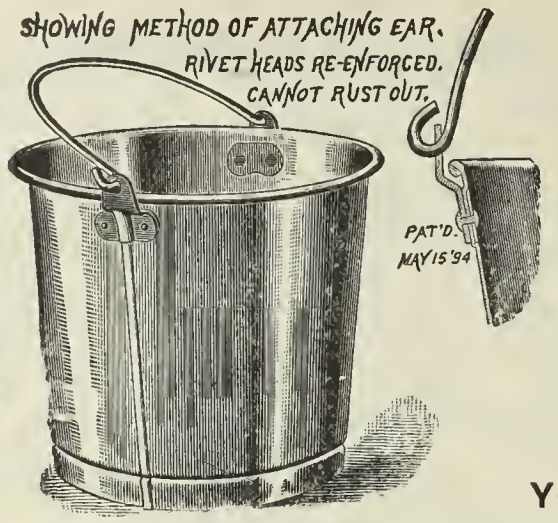

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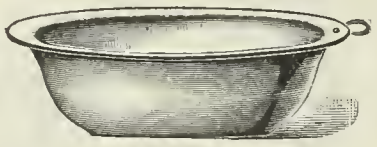

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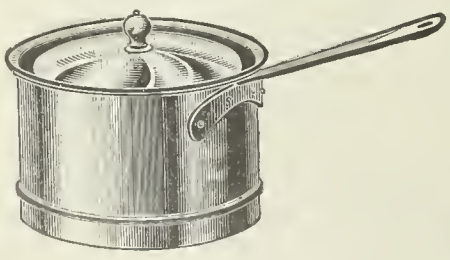

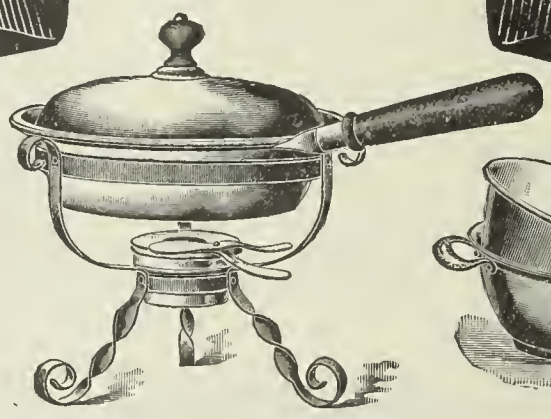

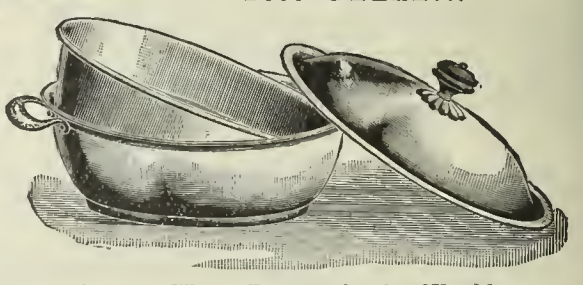

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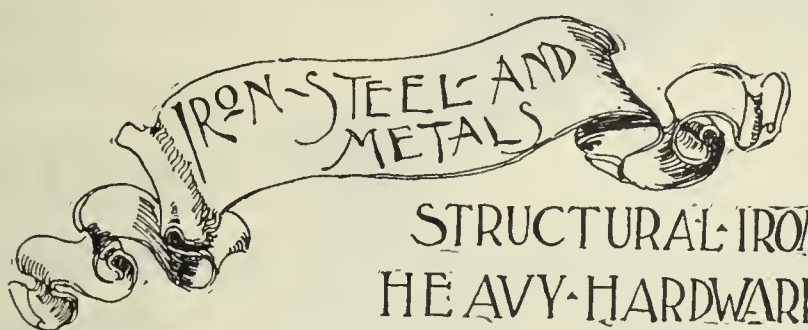

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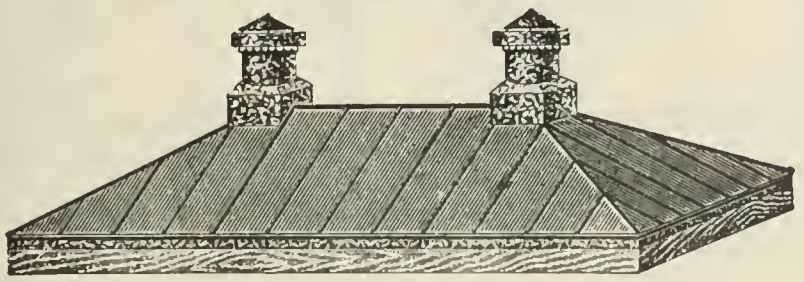

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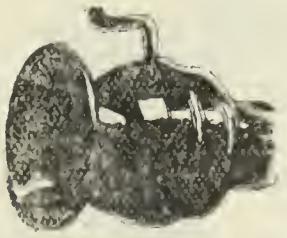

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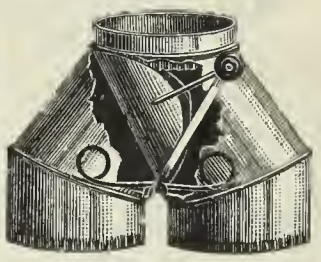

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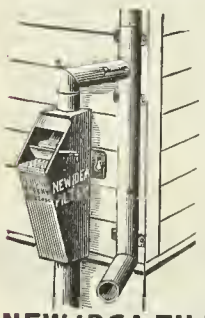

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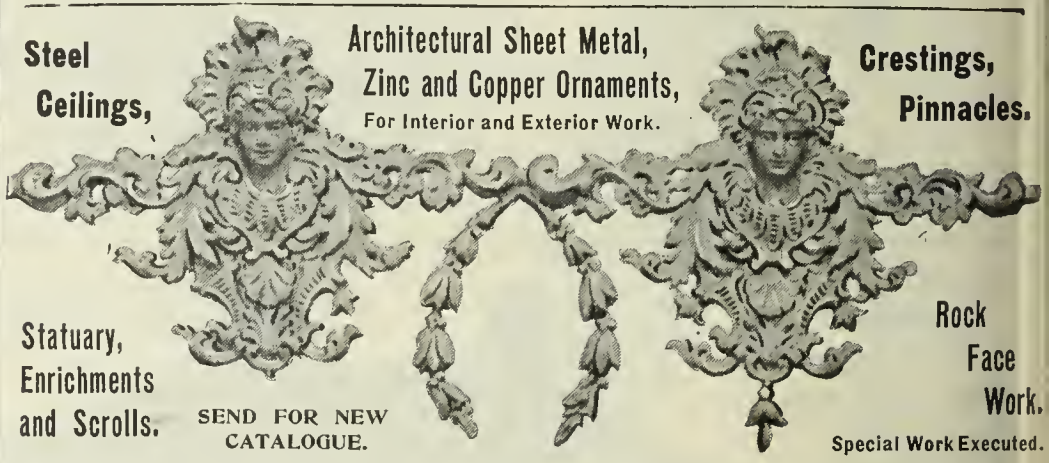

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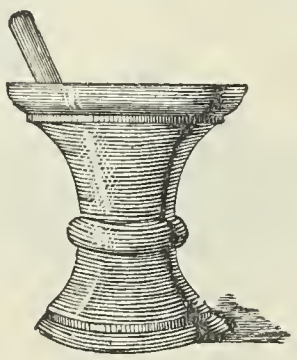

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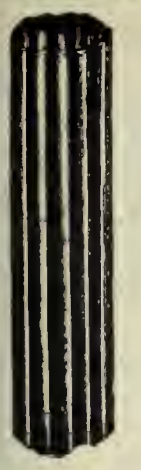

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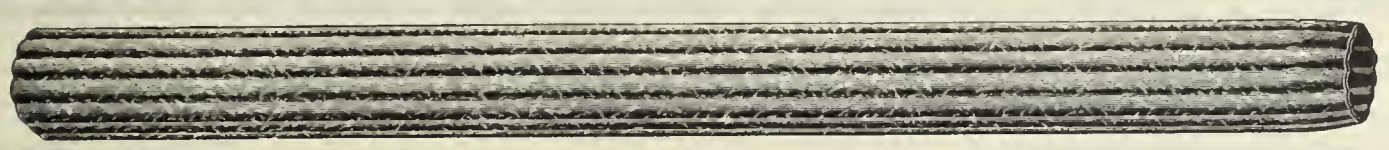

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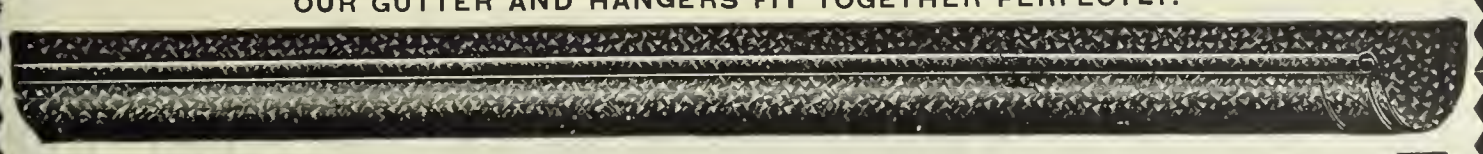

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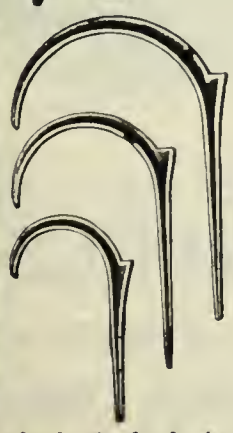

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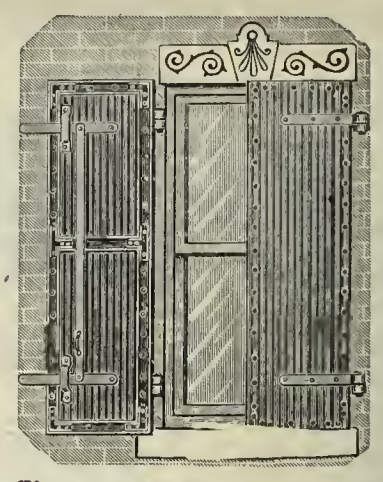

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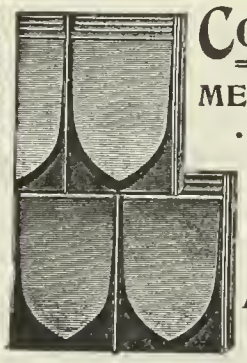

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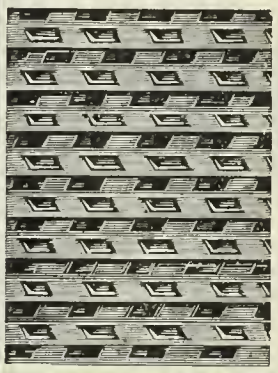

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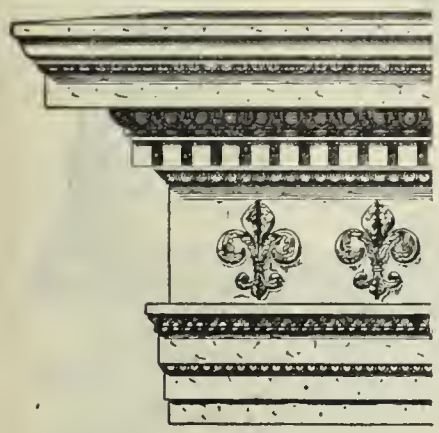

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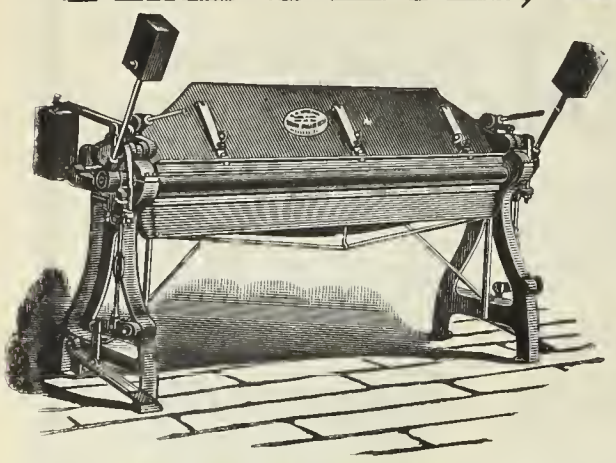

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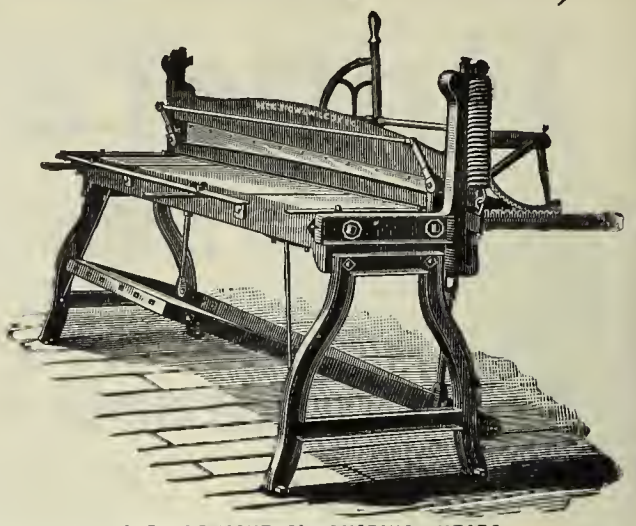

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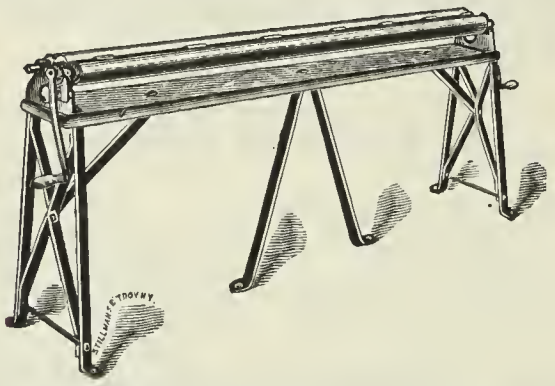

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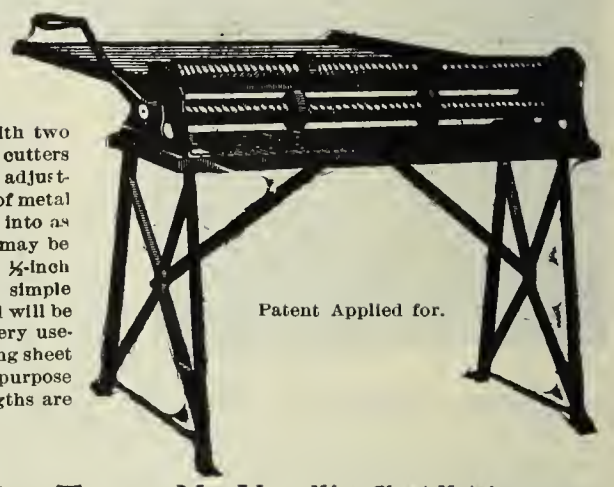

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"Lord Rosebery," said she breathlessly, "I must see you on a most important subject, and at once."

"Very well, madam," said the urbane Secretary of State, holding open the door of the vehicle for her, "I beg of you to get in."

Delighted to be invited to drive with so important a personage, the talkative lady jumped into the carriage, Rosebery gently closing the door on her, and befor she could expostulate, she heard him saying to the coachman:

"Take the lady wherever she wishes to go, James, and then go home."

Looking out of the window, the now irate occupant saw her late victim stepping into a cab.—*Harper's Round Table.*

—NO HATRACKS NEEDED THERE.—Speaking of wind, a traveler down in Osage County was astonished the other day to see a lot of farm hands walk up to the house at the dinner hour and place their hats against the wall. The wind held them in place as firmly as if they had been hung upon so many nails. —*Kansas City Journal.*

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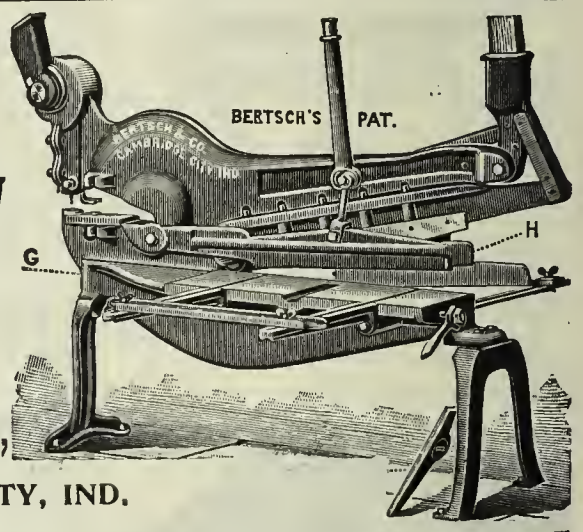

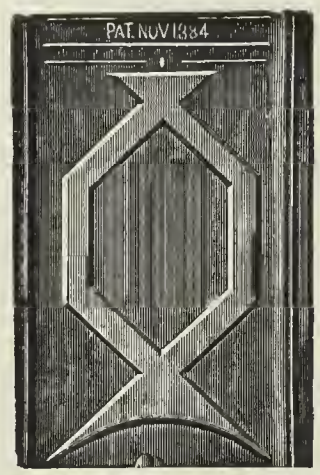

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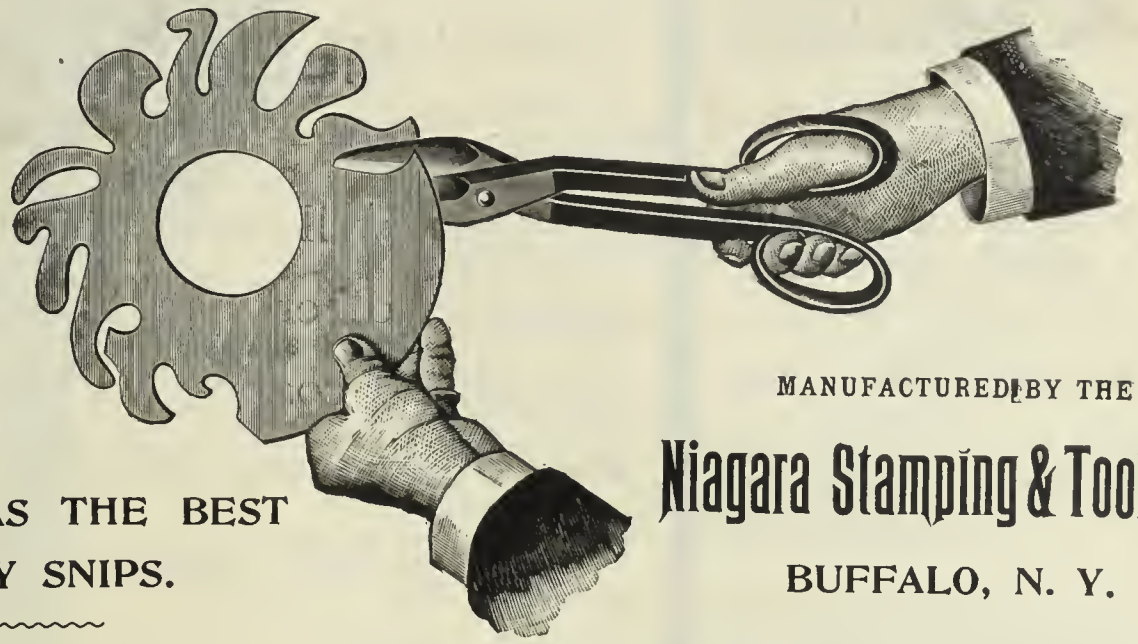

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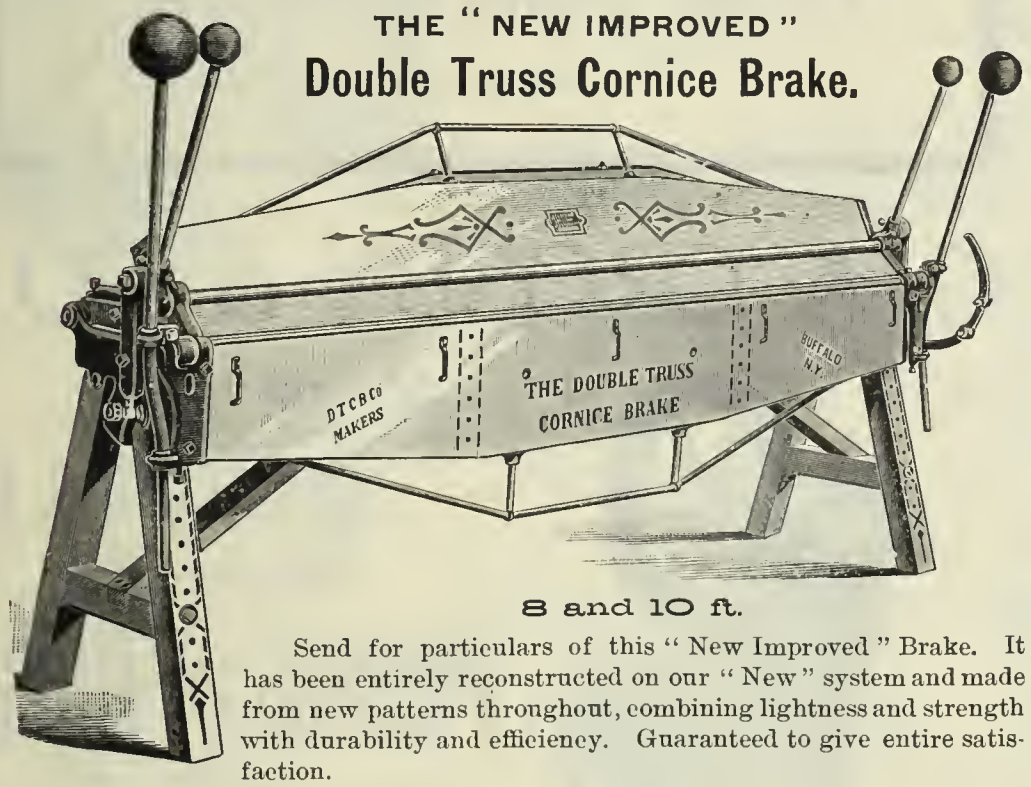

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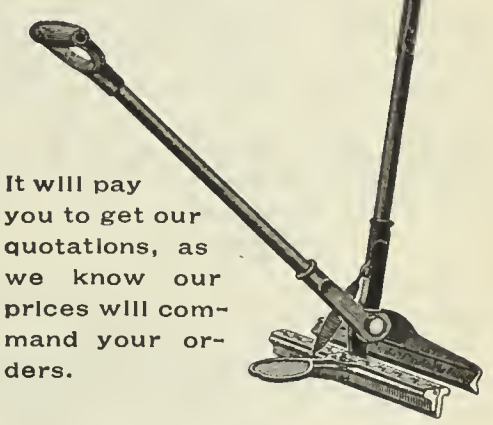

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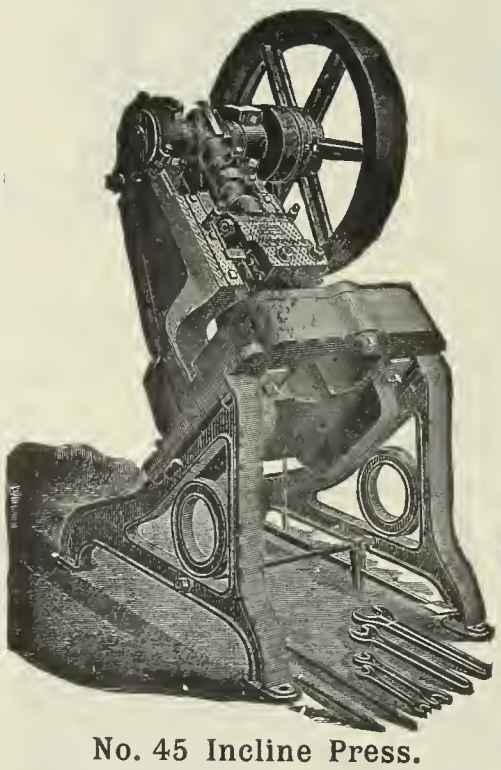

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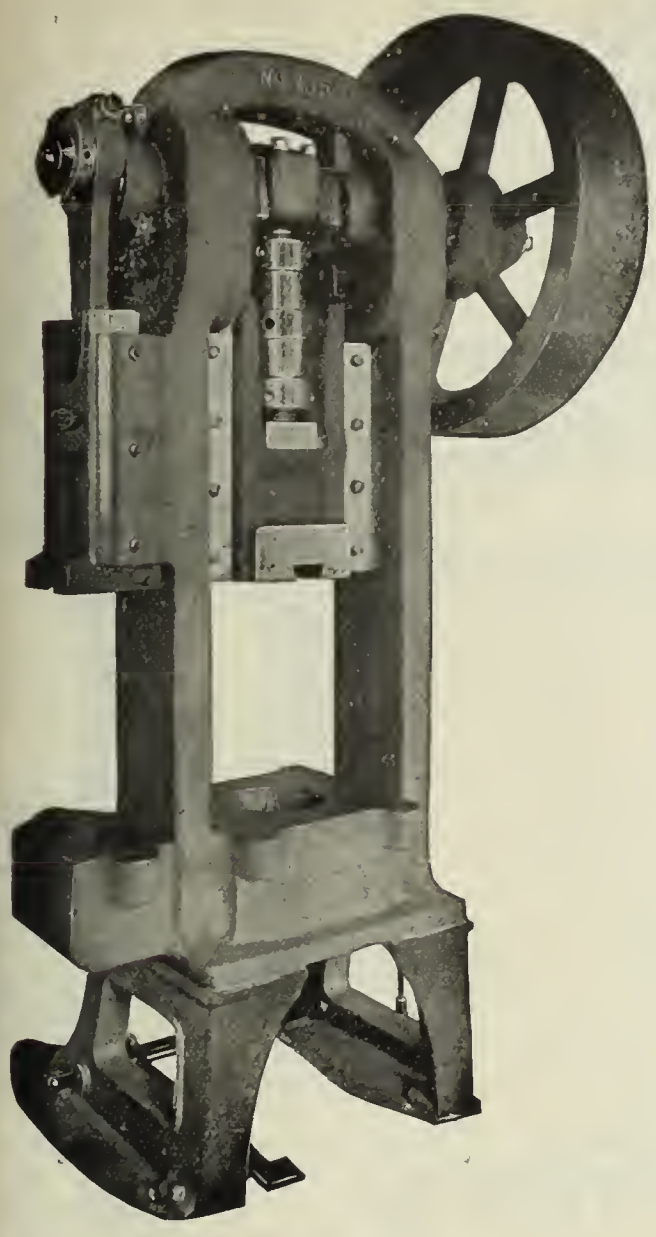

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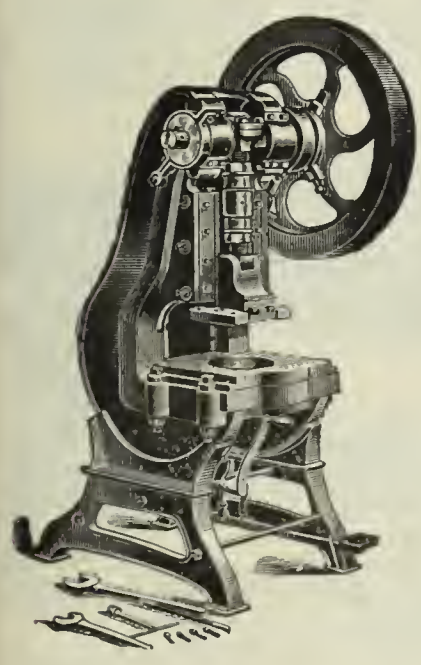

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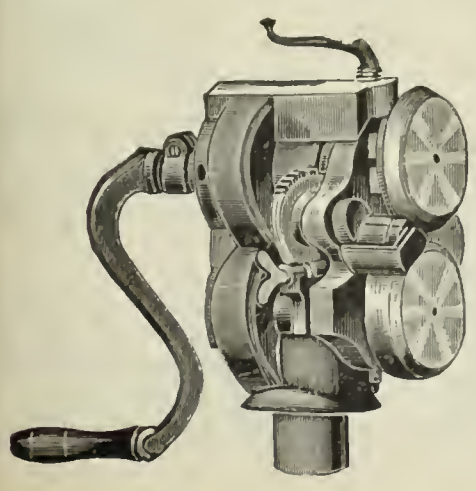

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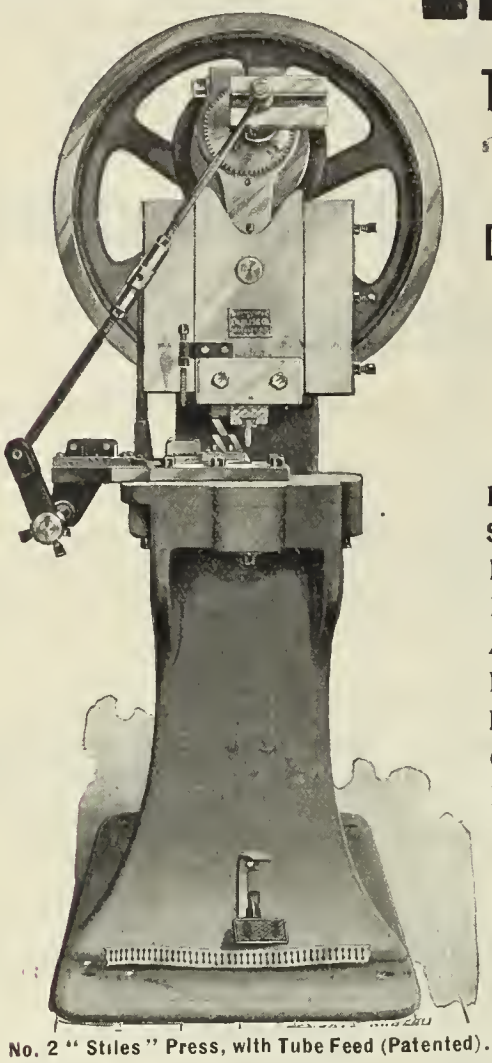

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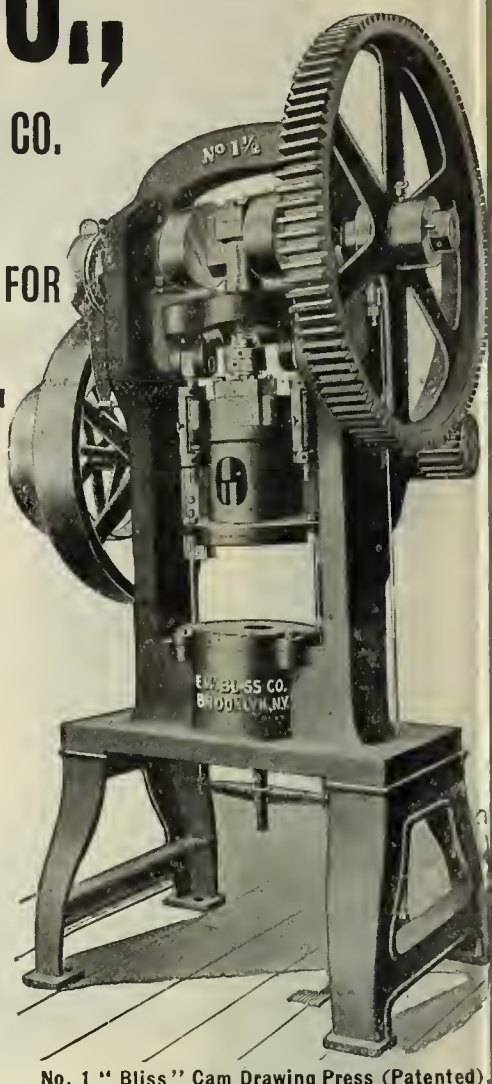

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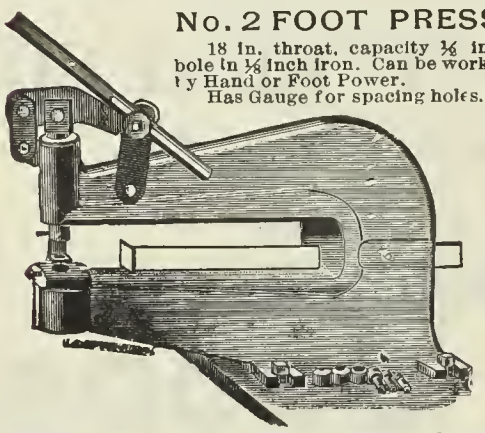

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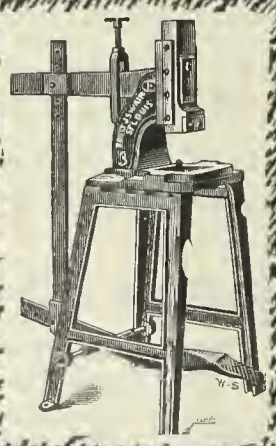

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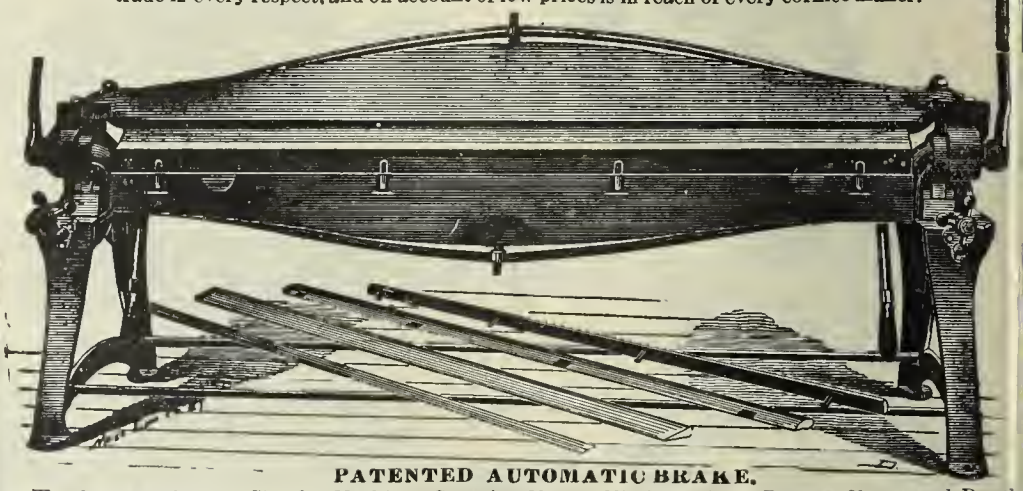

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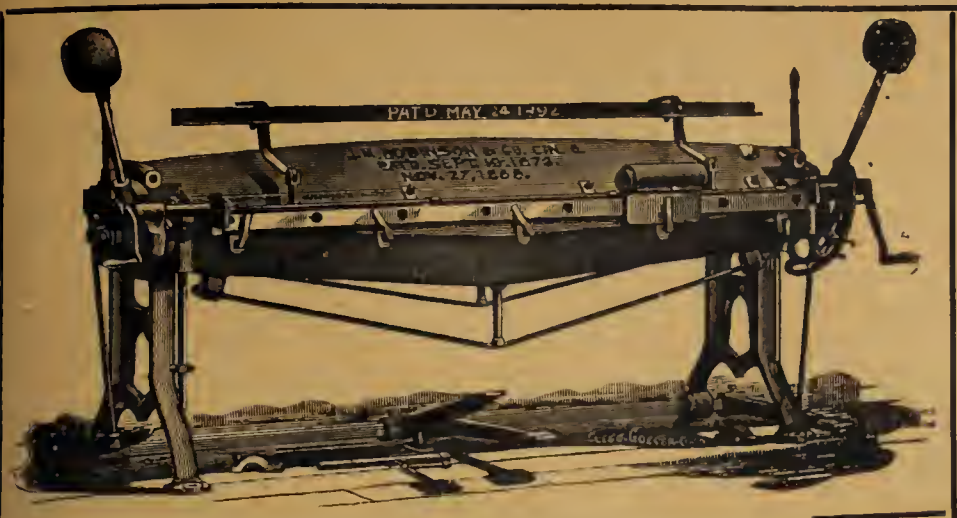

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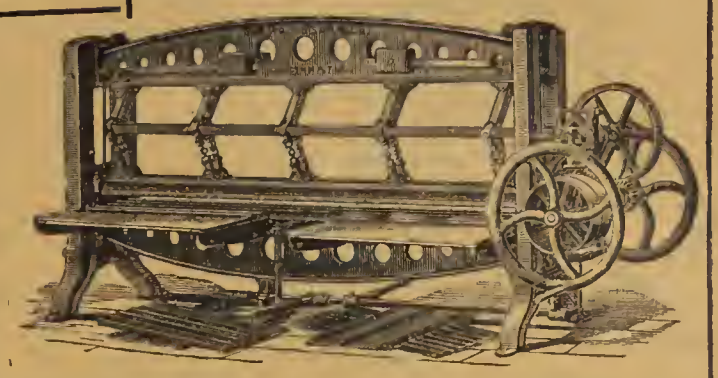

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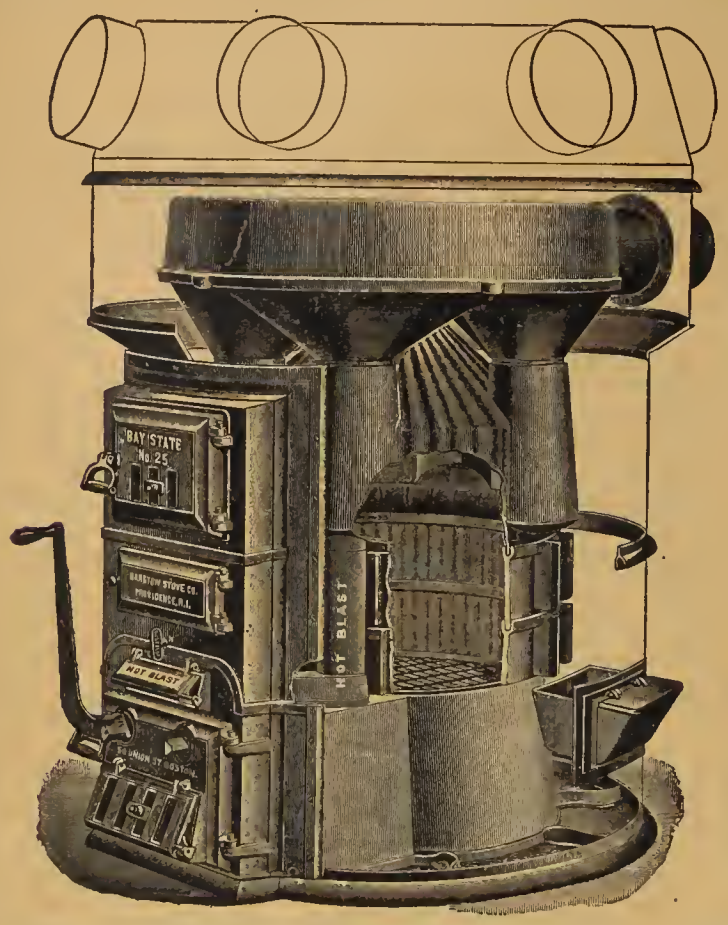

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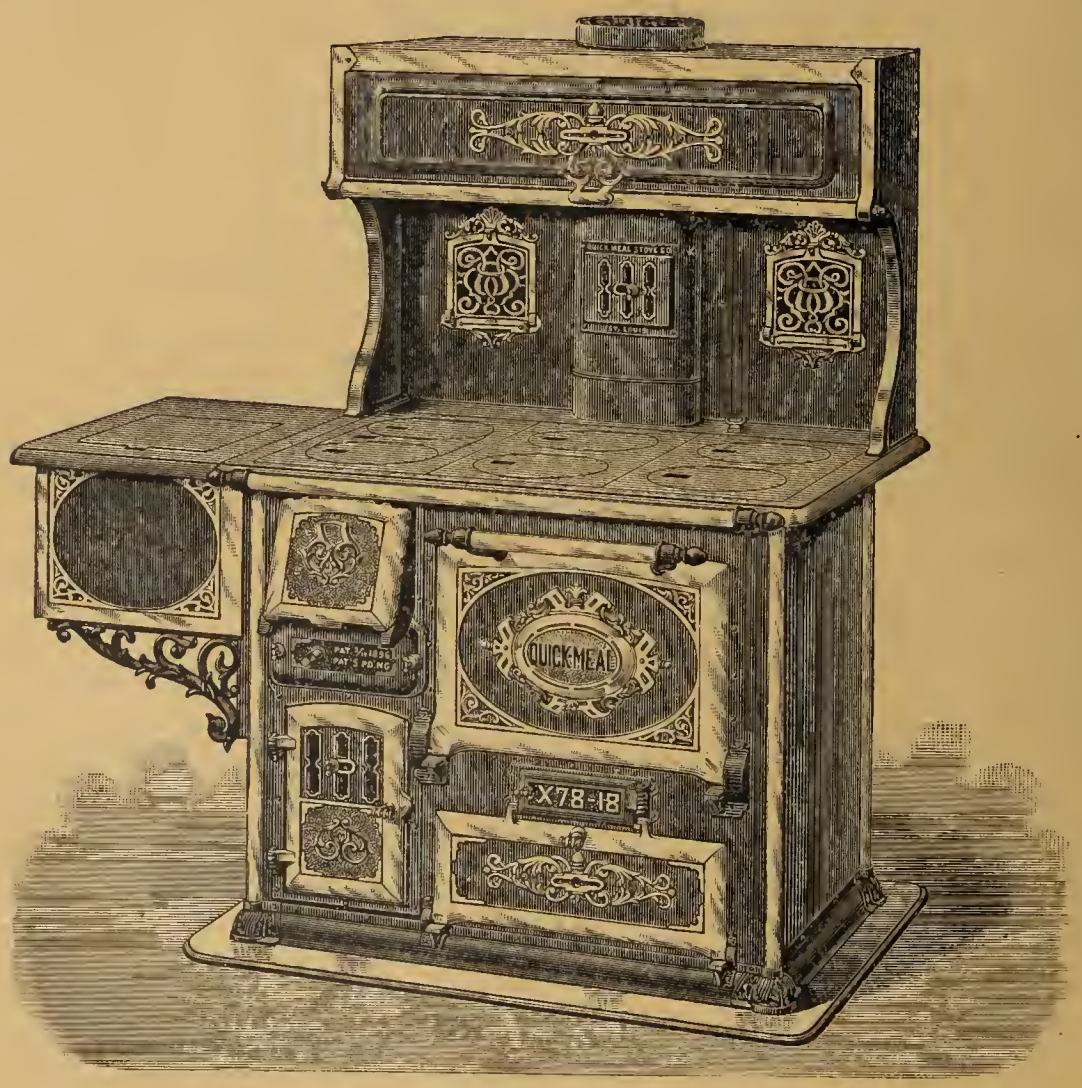

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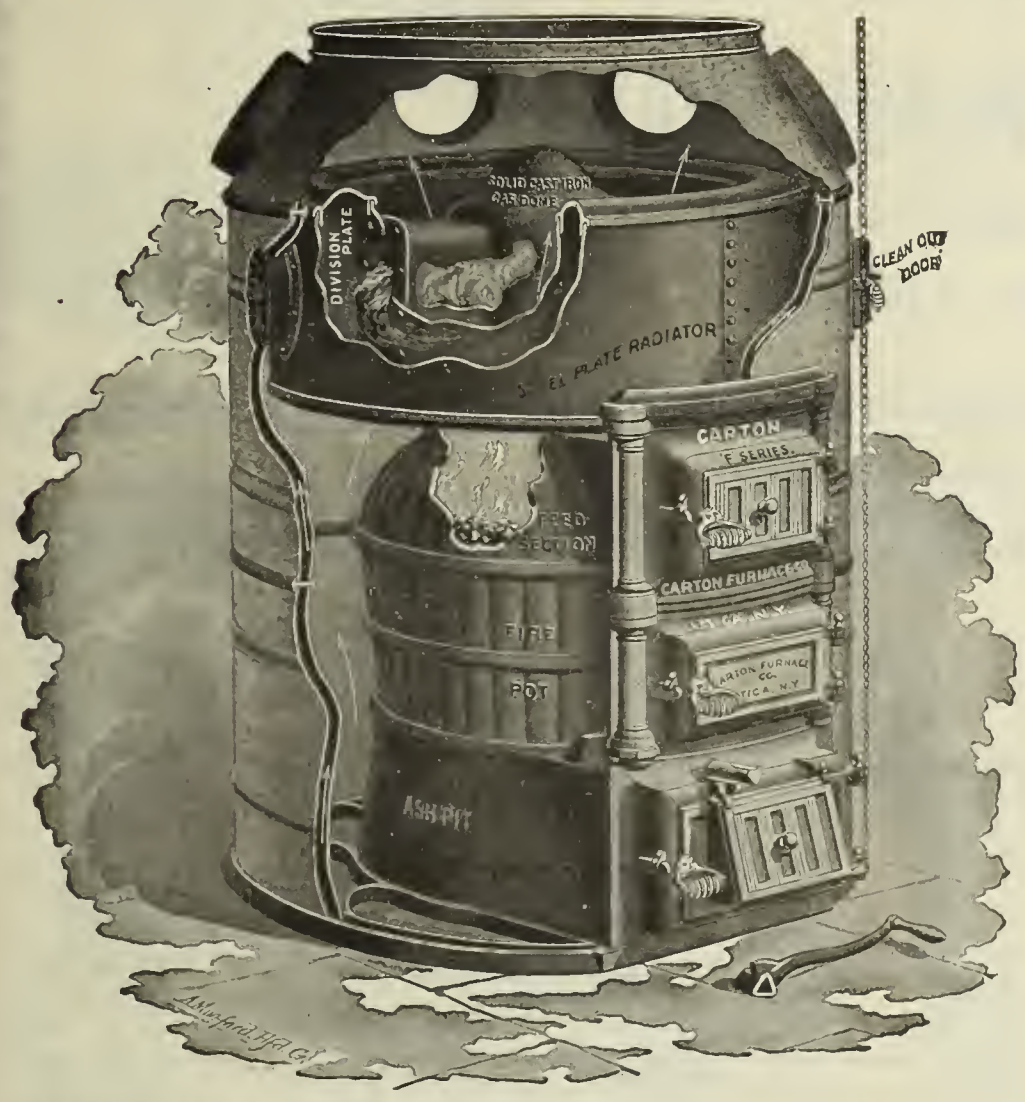

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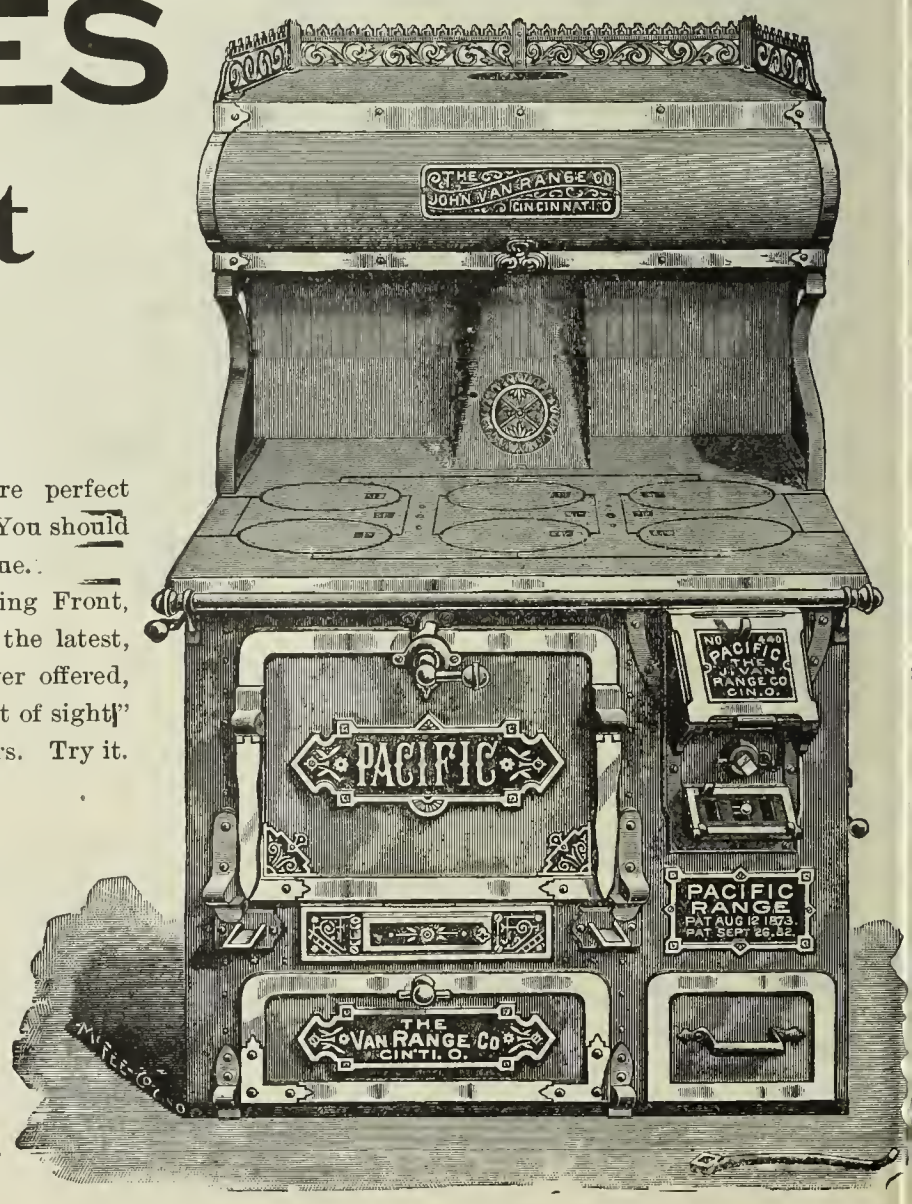
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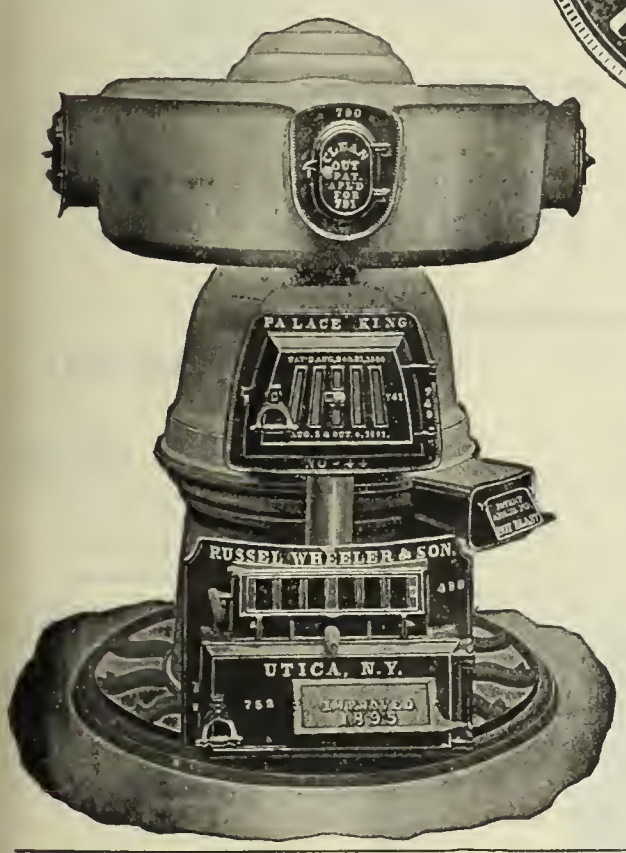

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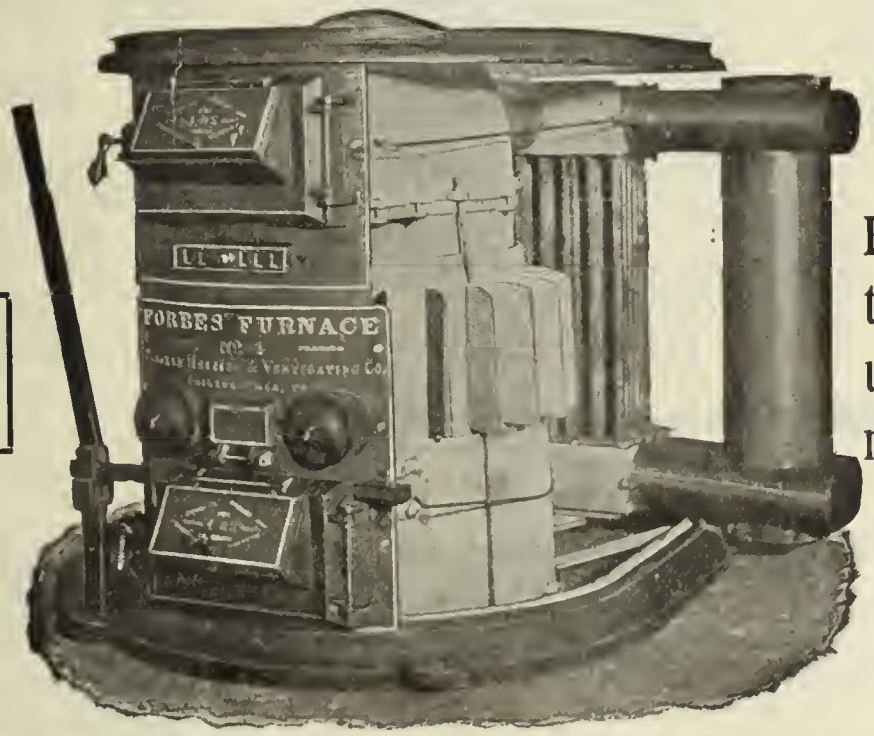

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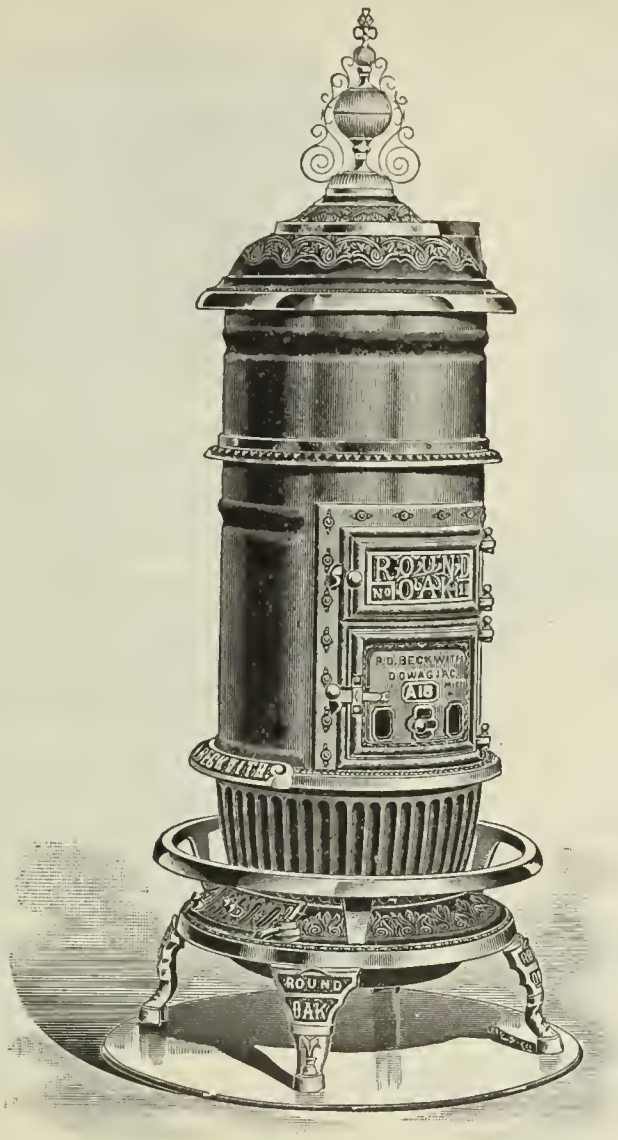

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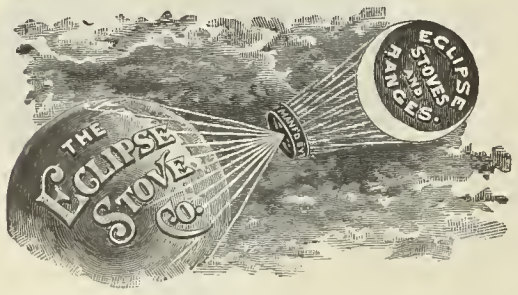

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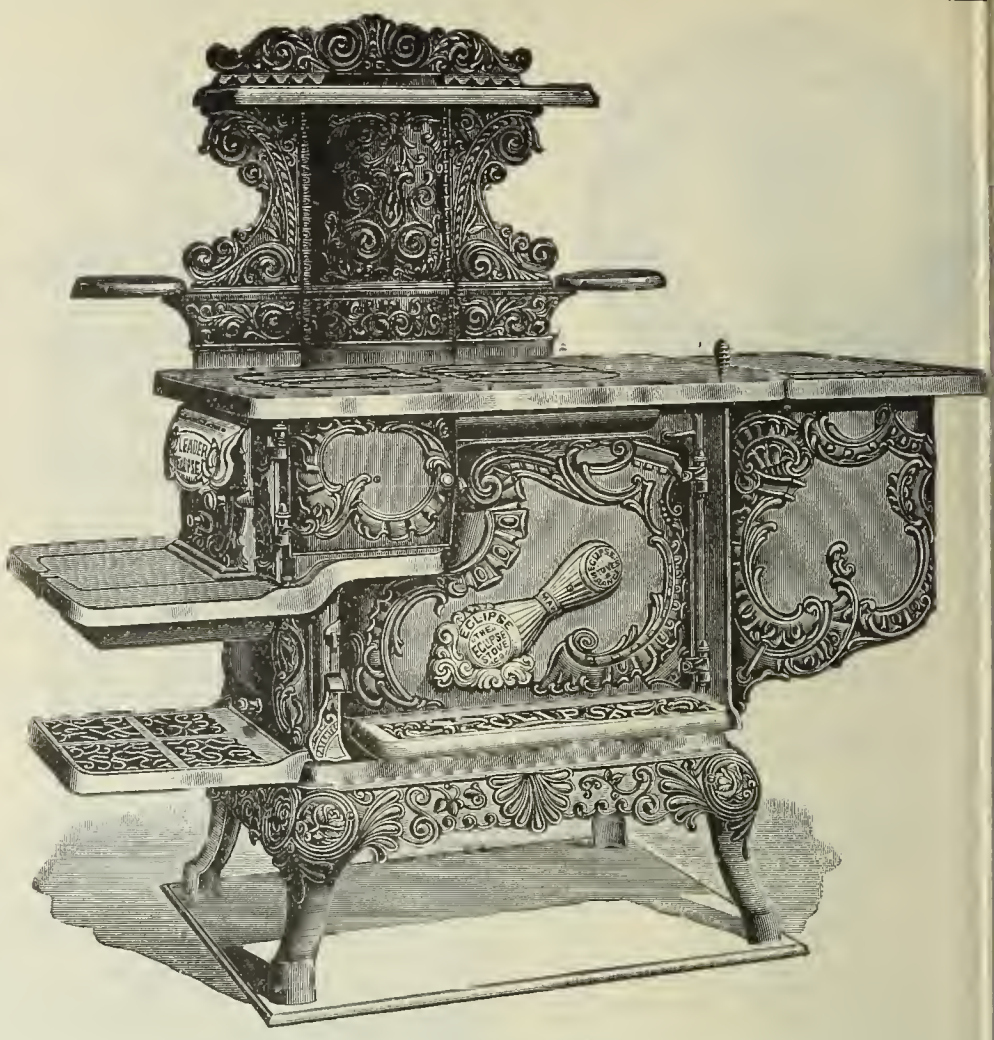

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See our Steel Range Adv. on Page 14.

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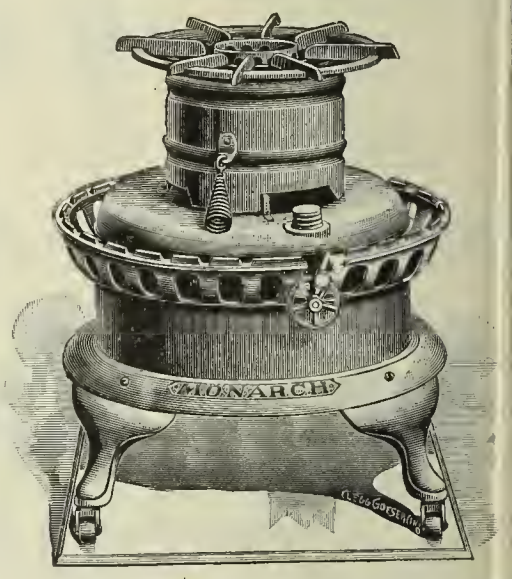

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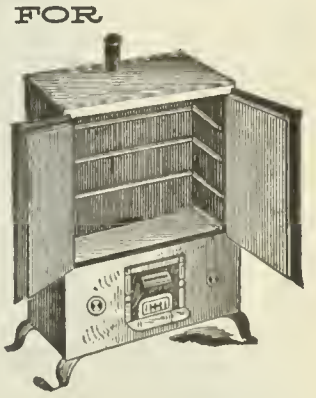

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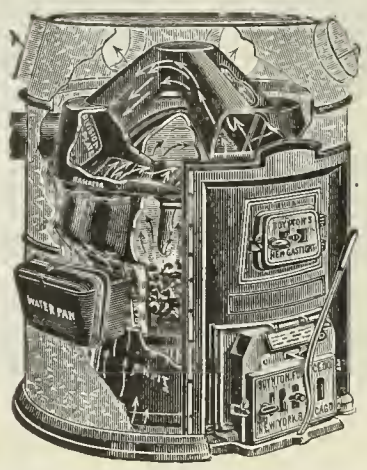

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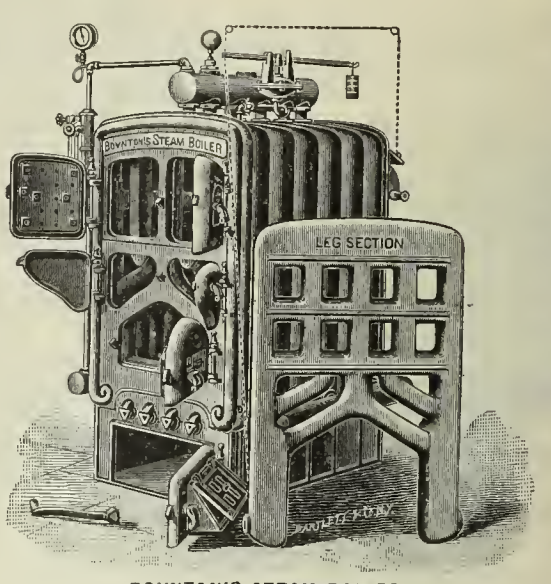

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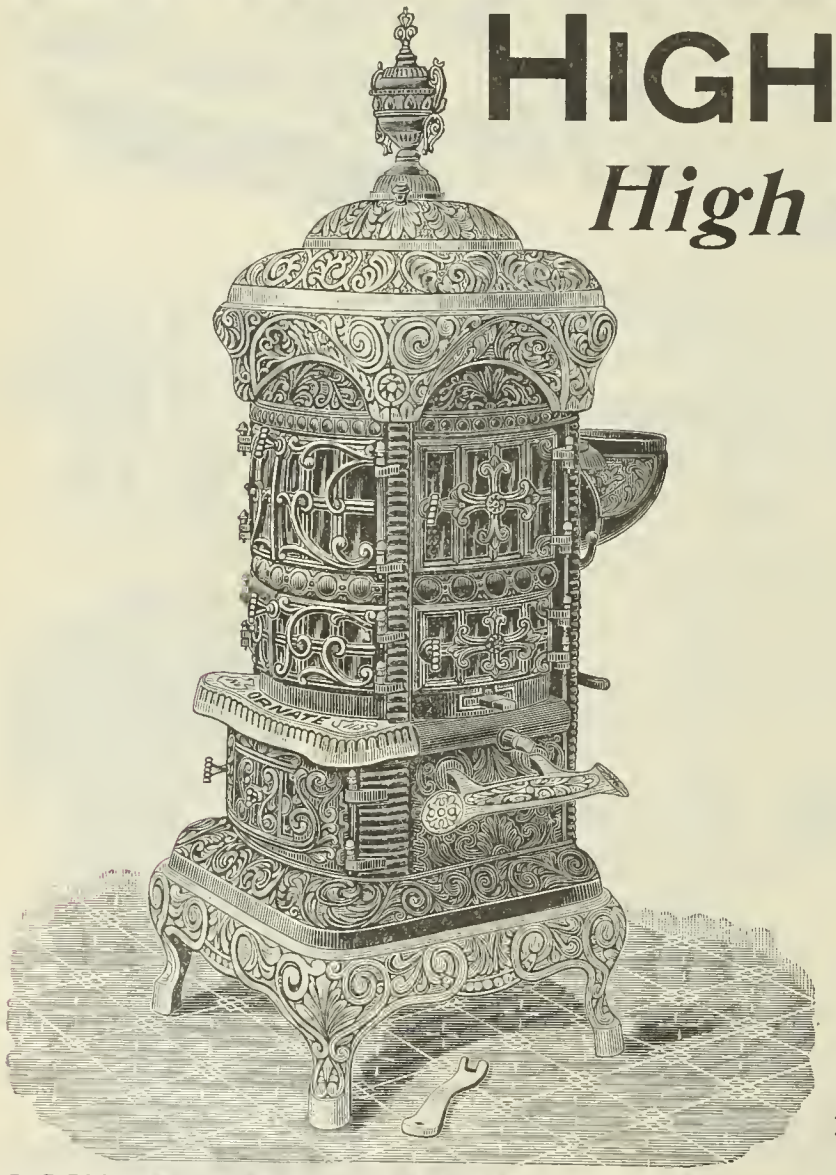

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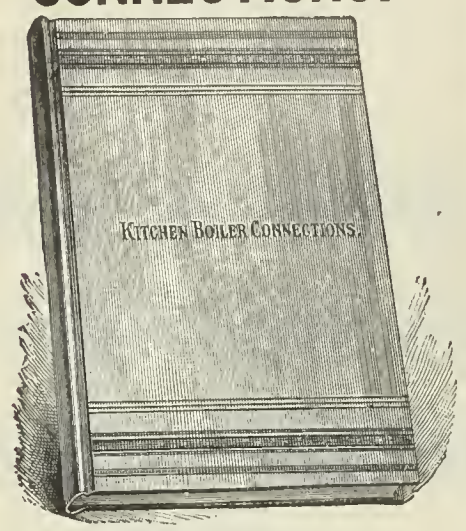

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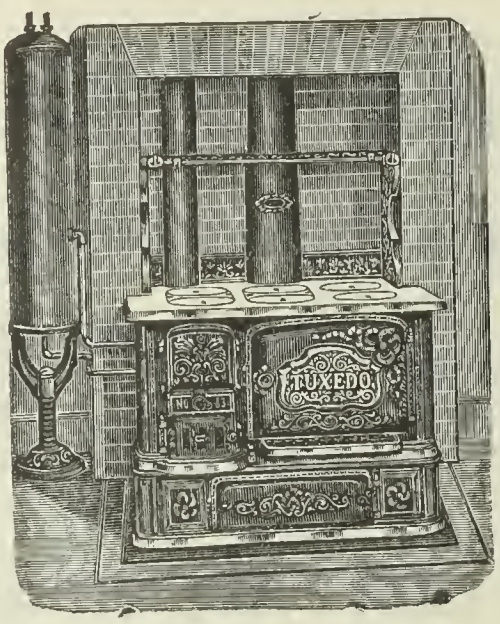

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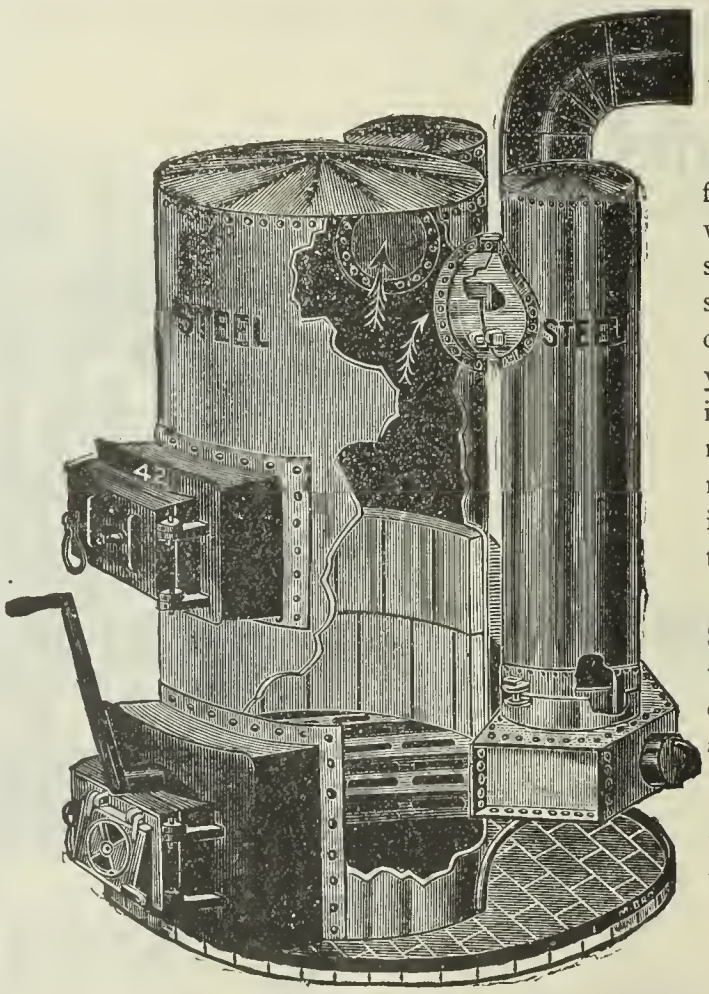

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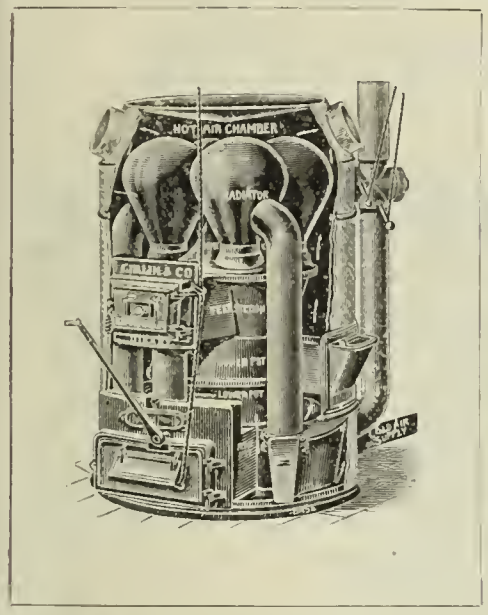

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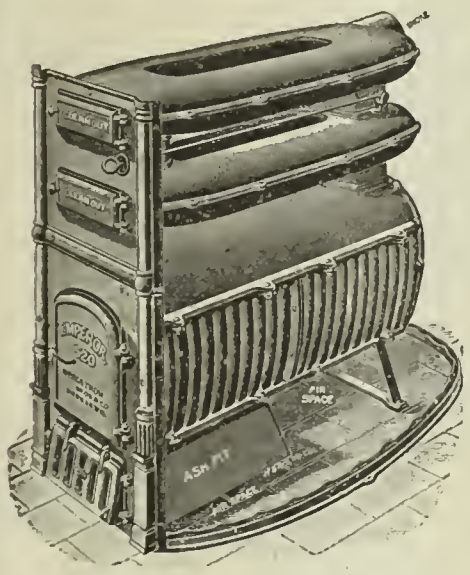

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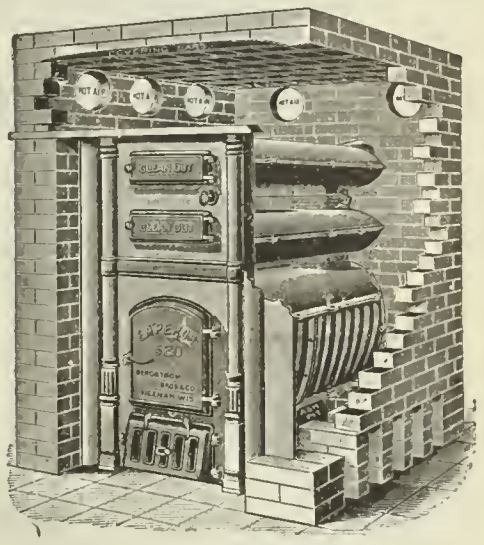

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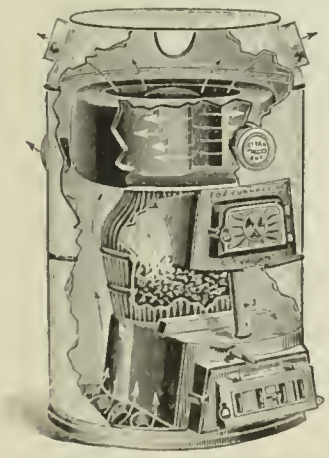

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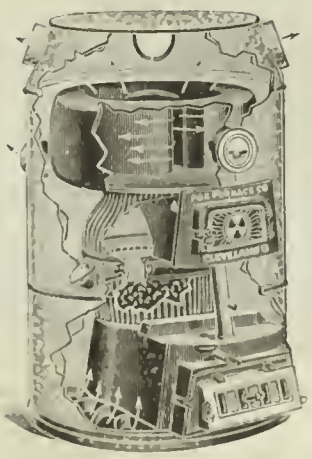

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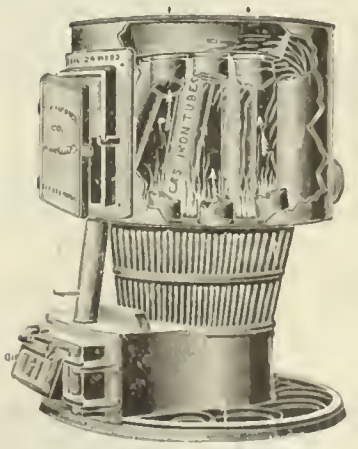

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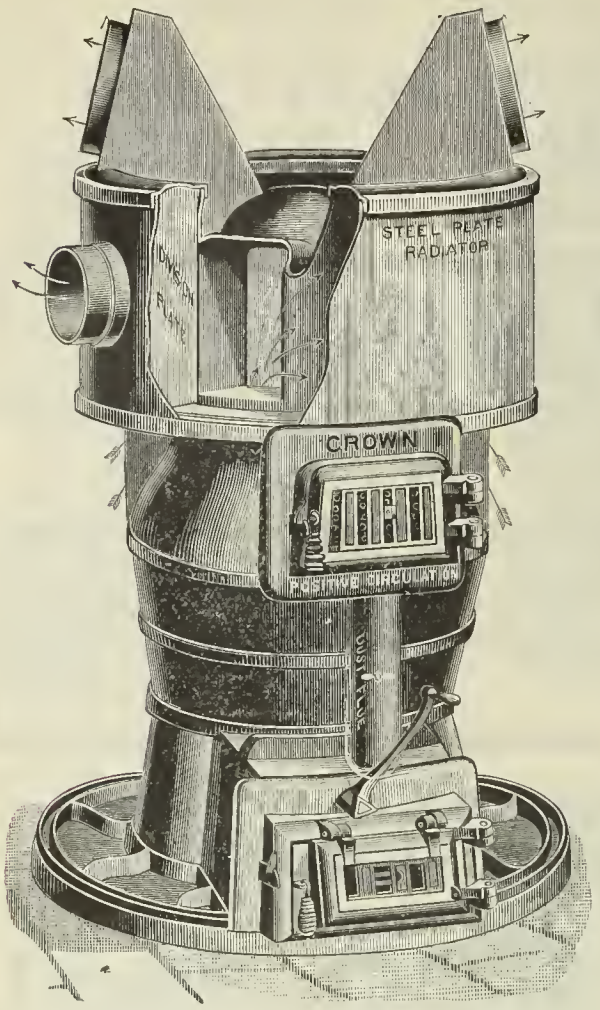

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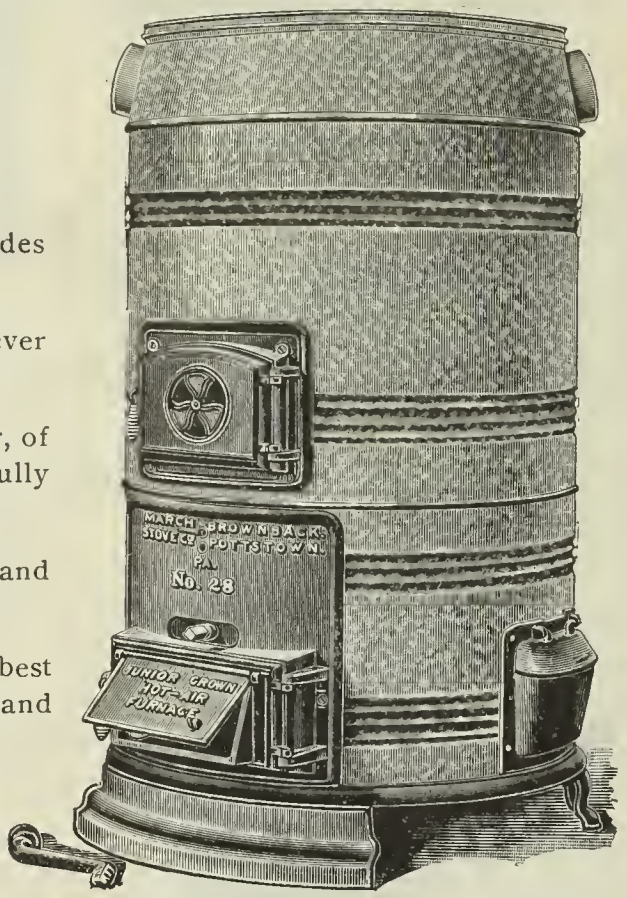

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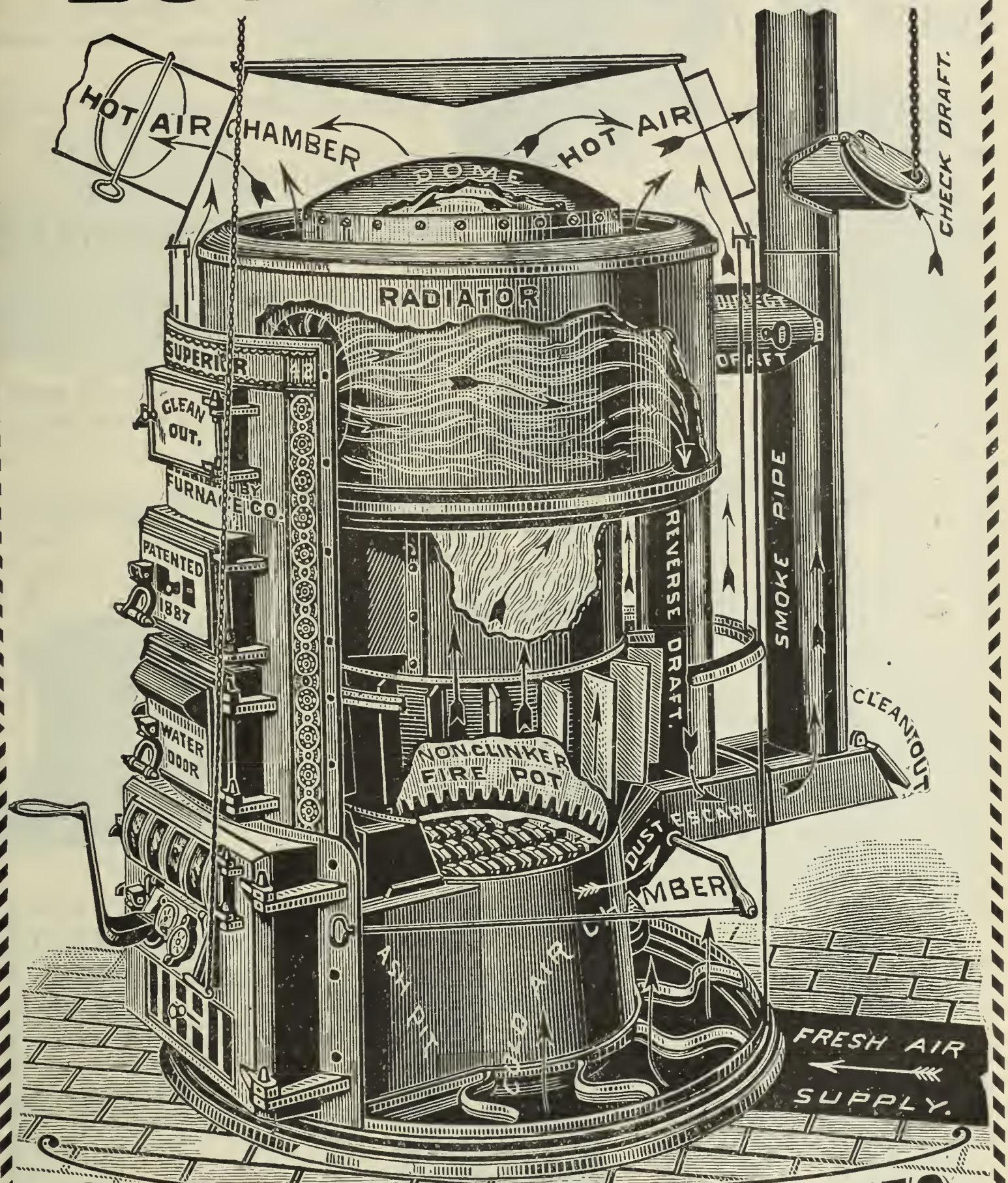

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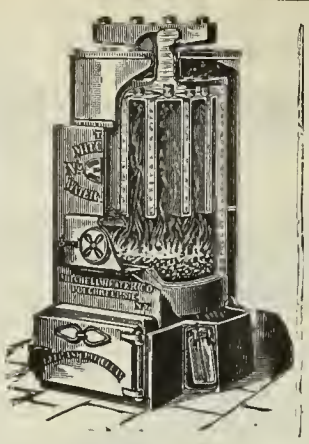

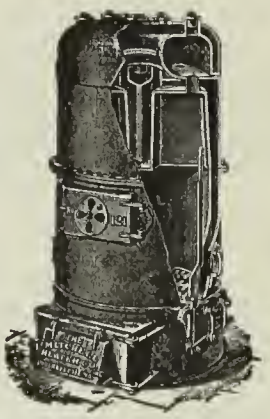

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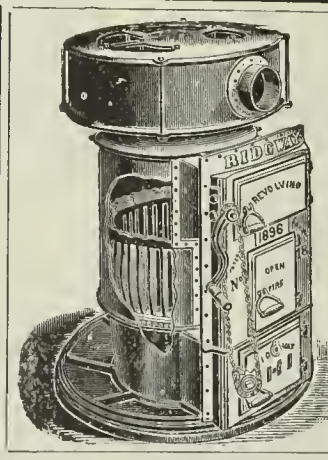

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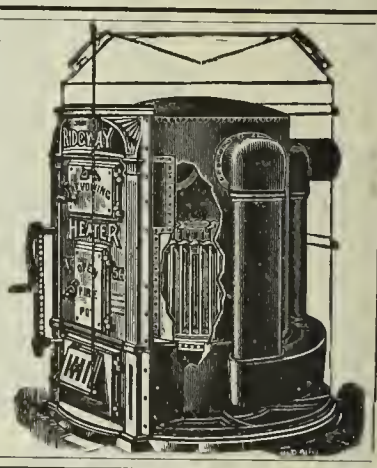

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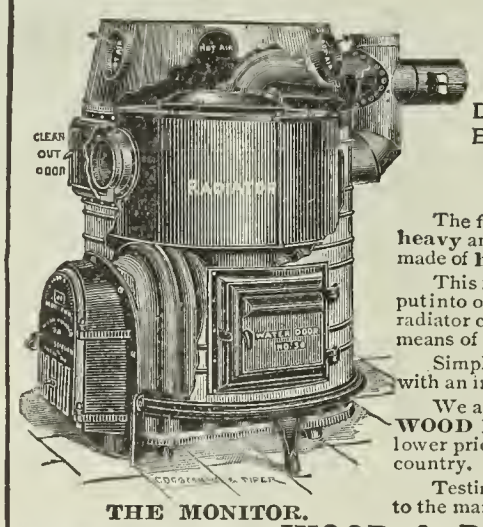

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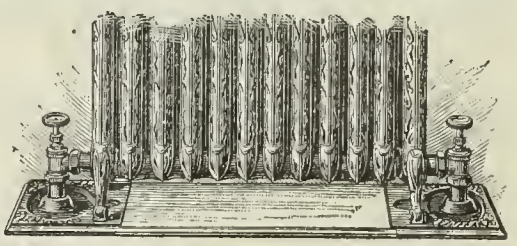

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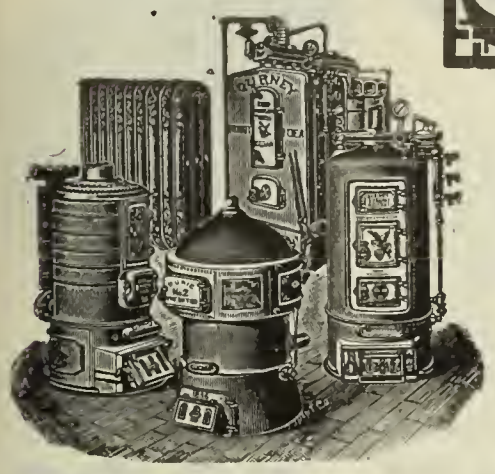

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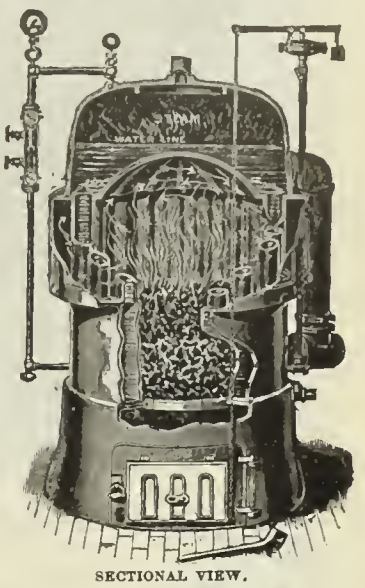
...REQUIREMENT...

Hot Water Heaters,
Steam Boilers and Radiators.
THE STANDARD OF THE WORLD.
SEND FOR LATEST TRADE CATALOGUE.

SOLD ONLY THROUGH THE TRADE.

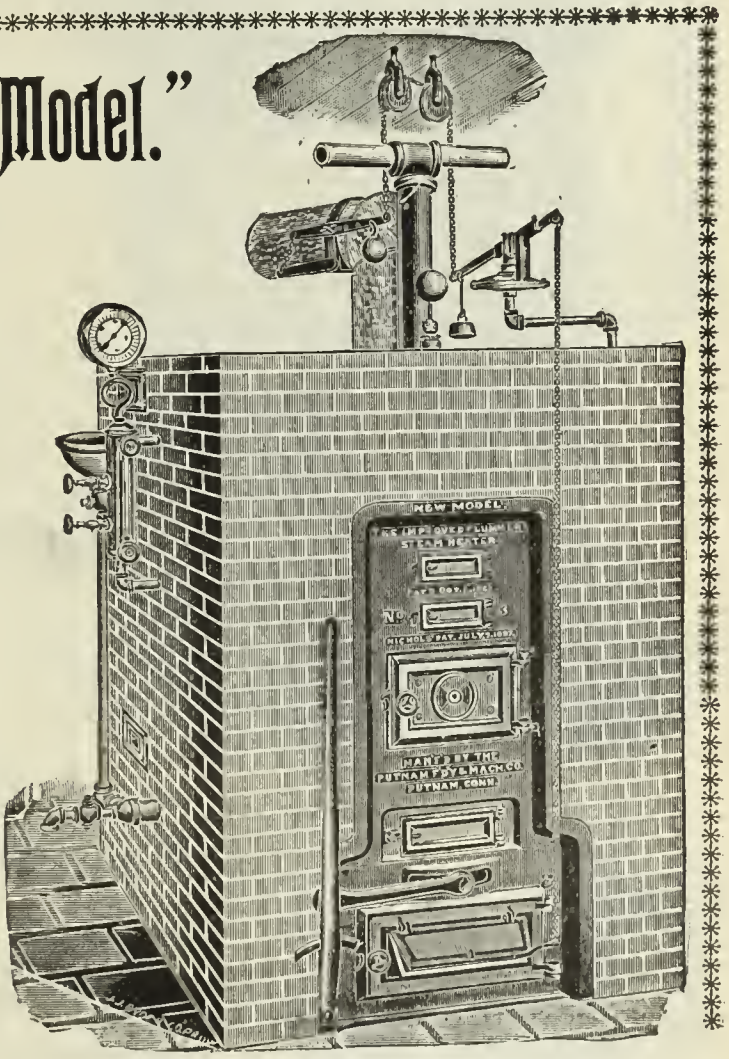
GURNEY HEATER MFG. CO.,

163 Franklin St., Cor. Congress,
BOSTON, MASS.
New York City Branch, 48 Centre Street.



SECTIONAL VIEW.
DORIC SEAMLESS TUBULAR STEAM BOILER.

BRICK SET "Plummer" STEAM HEATER "New Model."



A powerful and economical heater that has stood the test as a practical house warmer for 12 years.

MADE IN OUR OWN FOUNDRY AND MACHINE SHOP.

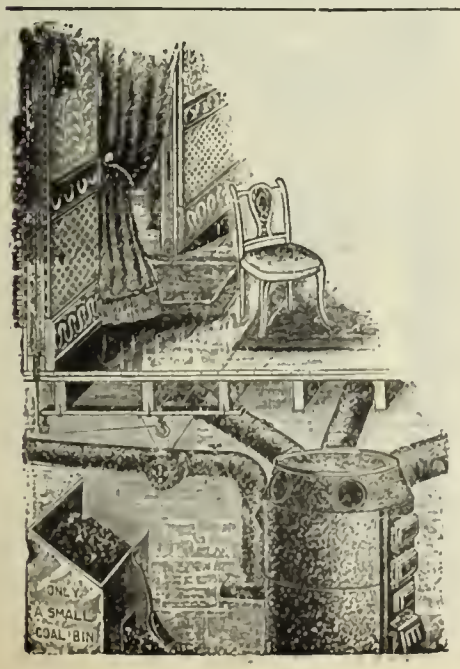
Send for Prices and Territory.

The Putnam Foundry and Machine Co.

PUTNAM, CONN.

MANUFACTURERS OF

Plummer Steam Heater, Leader Hot Water Heater,
Plummer Sectional Boiler, Nutmeg State Furnace.



REGULATORS

WHICH ARE GUARANTEED TO

REGULATE

THEMSELVES AS WELL AS THE HEATER.

AGENTS WANTED IN YOUR TOWN.

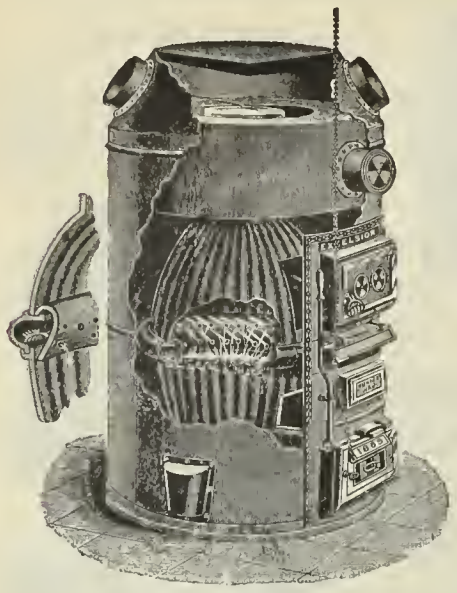
Write to the Mfrs.,

HOWARD THERMOSTAT CO.,

OSWEGO, N. Y.

NO ELECTRICITY, VAPOR, or COMPRESSED-AIR, etc., etc., but simply contraction and expansion of a plate in the rooms.

New York Office, 210 Water Street.



FURNACES
AND
FITTINGS.

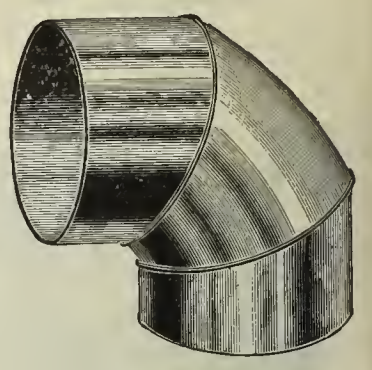
ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

THE EXCELSIOR STEEL FURNACE CO.,

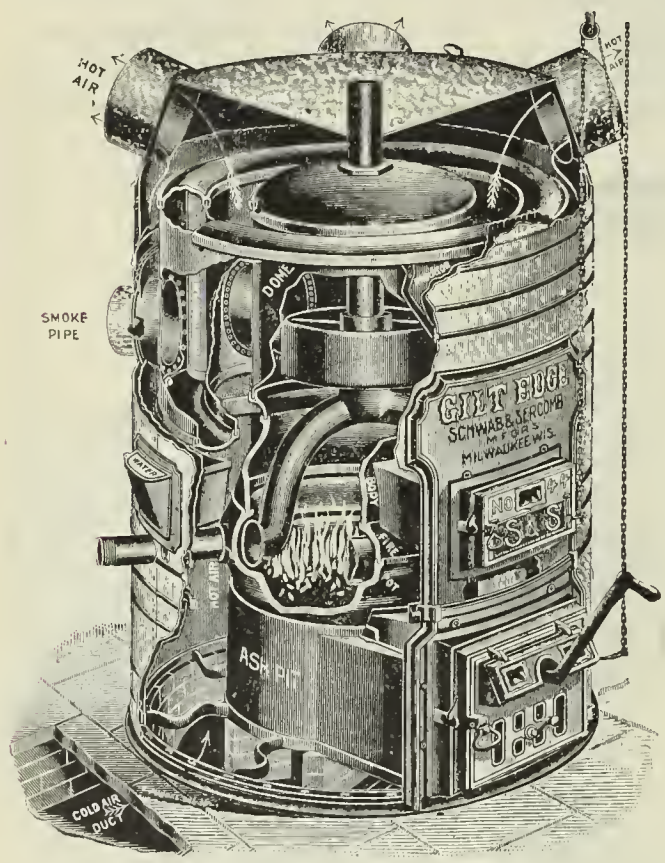
38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.



The GILT EDGE

COMBINATION WARM AIR & HOT WATER HEATER

IS NO EXPERIMENT.

Has Stood the Test.

Write us for Illustrated Circulars and Catalogues.

THIS IS A SAMPLE OF MANY TESTIMONIALS:

DELTA, OHIO, May 20th, 1897.

Messrs. SCHWAB & SERCOMB, Milwaukee, Wis.

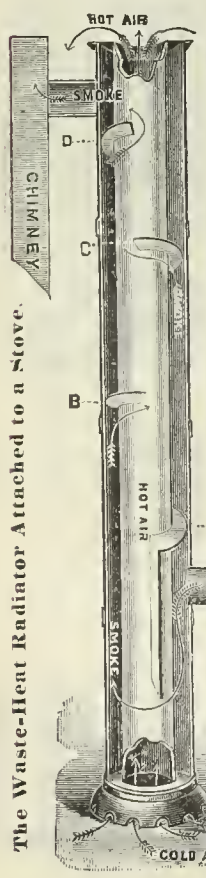
GENTLEMEN:—The combination hot air and hot water heater that you placed in my residence in the fall of 1896 is perfect in its operation and entirely satisfactory in its heating results. There are nine hot water radiators and ten hot air registers, making a perfect distribution of heat. You may refer anyone to me for the strongest endorsement of this system. Yours very truly, J. M. LONGNECKER.

We make Warm Air Furnaces adapted to any fuel or climate.

SCHWAB & SERCOMB,

E. E. DUNNING,
Manager Heating Department.

MILWAUKEE, WIS.



The Waste-Heat Radiator Attached to a Stove.

THE
WASTE-HEAT RADIATOR

saves the heat that is usually wasted up the chimney; takes the cold air off the floor and heats it; takes the hot air from the ceiling and puts it on the floor; **saves half the coal.** As the cold air is drawn in and up from the floor the hot air on the ceiling comes down to take its place, securing a continuous circulation.

Waste-Heat Radiators.

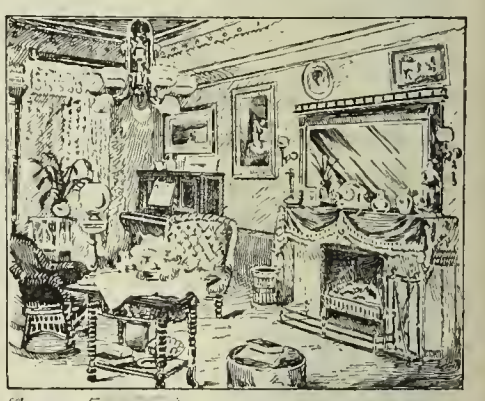
TO DEALERS IN STOVES AND FURNACES:

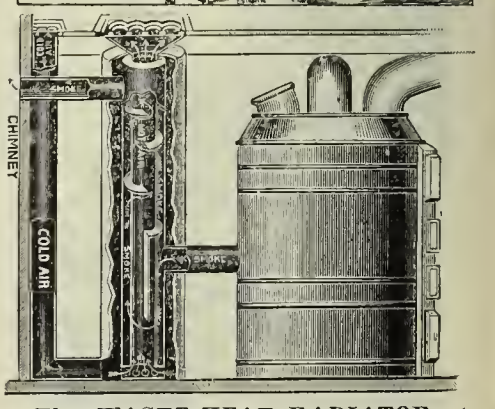
We want to send you one of our No. 5 Waste-Heat Radiators. We don't ask you to buy it, we simply ask you to put it on your stove in your store or in your house and try it, and if you find it as good as we say it is—that it saves a fourth to half the coal—then we want you to buy it, and take the sale of them in your city, but if you do not find it as we say it is, then hold it subject to our order. We **know** that they save a fourth to half the coal, and think the quickest way to get them on the market and make some money out of them is to send one to one good stove man in every city and let him try it on his own stove, and find out for himself what they will do. Awaiting your response, we remain,

Yours respectfully,

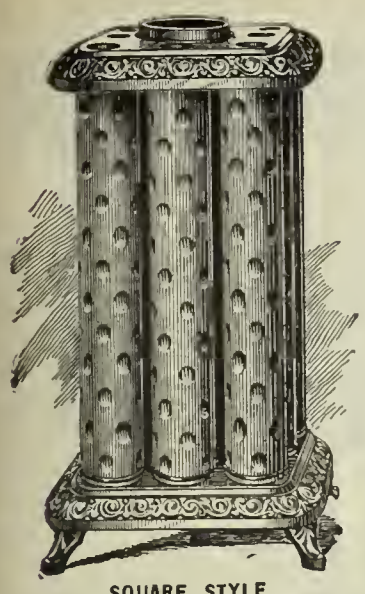
T. H. GREEN & CO.,
Duluth, Minn.

WASTE-HEAT RADIATOR CO.,
Buffalo, N. Y.





The WASTE-HEAT RADIATOR attached to a hot-air furnace; attaches to steam and hot-water boilers in the same way.



SQUARE STYLE.

DO YOU WANT TO INCREASE YOUR BUSINESS?

You can do so. There is no question about it at all. An article that will make one fire do the service of two fires finds many buyers as soon as people know about it.

New Era Radiators

do this, and there is a big profit on every one you sell. Drop us a card and we will send you a circular telling all about these Radiators and our special inducements for handling them. Do it now, so as to be ready for the opening of the season.

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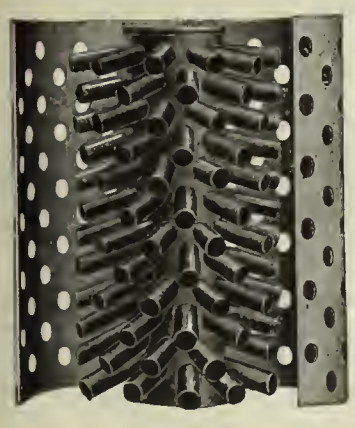
WILMOT CASTLE & CO., 76 Elm St., Rochester, N. Y.

SAVES 1/2 THE FUEL.



4,866 sq. ins.

THE "ROCHESTER" RADIATOR.

FOR USE ON FURNACES AND STOVES.

Manufactured ONLY by the Rochester Radiator Co.

Made in 7 Styles, and Retails from $3.25 up.

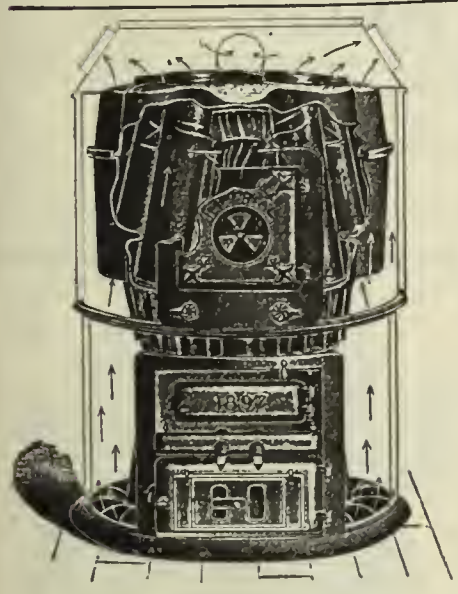
IT DOES NOT INJURE THE DRAFT, LEAK GAS OR CLOG.

Do not be misled by other makes which claim to be

THE ROCHESTER RADIATOR.

WRITE FOR PRICES AT ONCE. LIBERAL DISCOUNT TO THE TRADE.

100 FURNACE ST., **ROCHESTER RADIATOR CO.,** ROCHESTER, N. Y.



IMPERIAL FURNACE.

All Cast Iron Tubular Corrugated Radiator.

Enormous Radiating Surface,

Every inch Direct Fire Surface.

PRICES RIGHT.

Send for Printed Matter and Discounts.

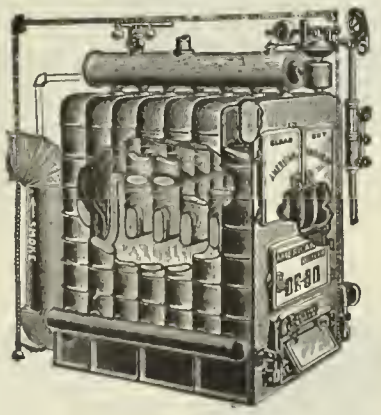
MADE BY

F. B. FOX,

108 Prospect St., CLEVELAND, O.

Sediment Accumulation

in heating boilers is a dangerous thing. May choke up the water passages, or cause them to burn out, or get into the valves and cripple them. Sediment does not accumulate in the



"American" Steam Boiler.

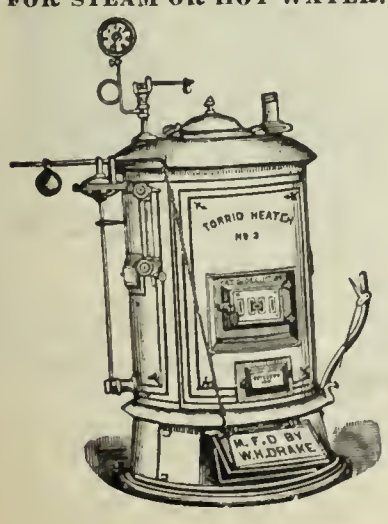
It is so constructed that all the water can be drawn from the heater when desired, so that no sediment need accumulate in the sections. *Send for "American" Book.*

American Boiler Company

CHICAGO: 84 Lake Street.
NEW YORK: 94 Centre Street.

"We Heat the World."

"TORRID" HEATER.
FOR STEAM OR HOT WATER.



IT IS PRACTICAL IN DESIGN.
IT IS SAFE, BEING TESTED TO 200 POUNDS.
IT IS EASY TO MANAGE AND KEEP CLEAN.
IT IS DURABLE.
IT IS SECTIONAL AND EASILY HANDLED.
IT HAS NO PACKED JOINTS.
IT IS SELF-FEED OR SURFACE BURNING.
IT HAS THE TORRID PATENT ROCKING AND DUMPING GRATE.
IT IS LOW IN PRICE.

SEND FOR CATALOGUE.

MANUFACTURED BY

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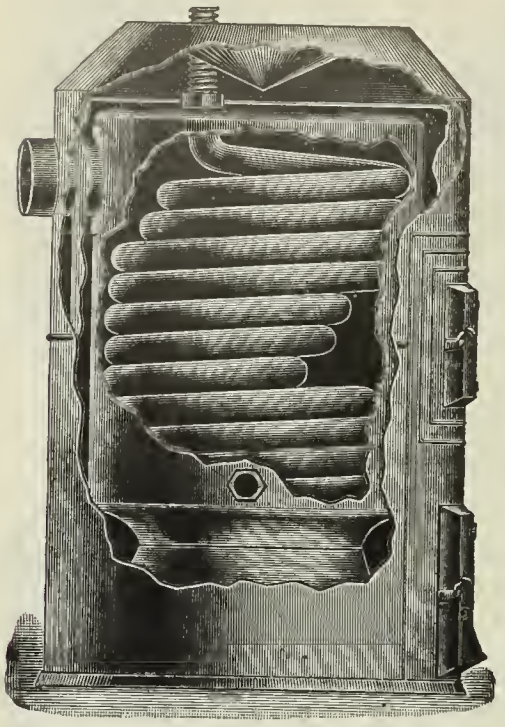
FACTORY: HACKETTSTOWN, N. J.

THE COMBINATION HOT WATER HEATER



—— FOR HEATING ——

HOUSES, STORES, CONSERVATORIES, and BATH ROOMS

by the combination of hot air and hot water if desired, or hot water alone.

The National Pipe Bending Co.,

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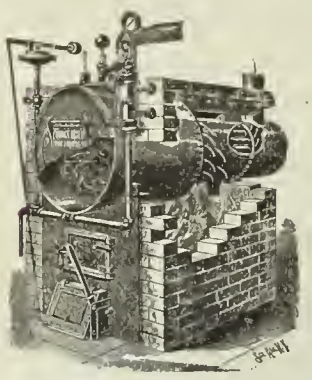
NEW HAVEN, - - CONN.



Vance Patent Boiler

FOR STEAM and HOT WATER HEATING

for Public and Private Buildings and Greenhouses. Adapted to burn hard or soft coal.

Heating Engineers with an experience of over 20 years.

The Vance Steam Boiler Works,

446 Lake Ave., Geneva, N. Y.

Established, 1827.

W. JACKSONS SONS,

Manufacturers and Importers of

Grates, Open Fire Places. Fenders, Fire Irons, And-Irons, Tiles, &c.

Office and showroom, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

See the New

Somerset Pallas Range.

It is the finest Range on the market.

ALSO

The Somerset Grand Parlor.

Send for Catalogue.

Somerset Stove Foundry Co., Somerset, Mass.

FOR WEALTH OF WARMTH USE THE BUNDY HEATER

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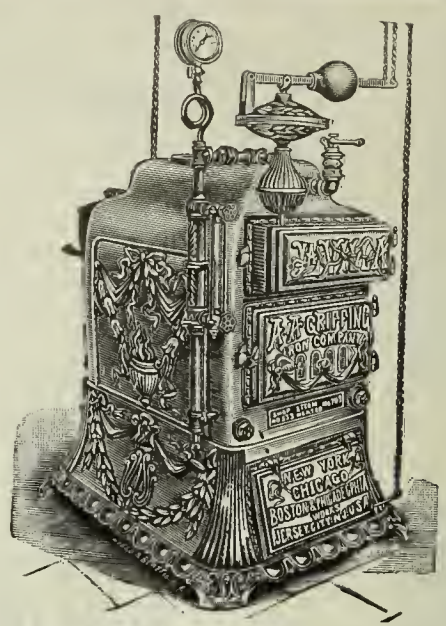
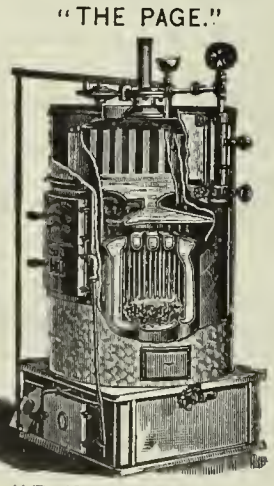


BUNDY LA VILLA HEATER.

FOR WEALTH OF WARMTH USE THE BUNDY HEATER

BOOK "SURE CURE FOR A COLD HOUSE" FREE A.A. GRIFFING IRON CO. 66-68 CENTRE ST. N.Y.

"THE PAGE."



"Built to Heat."

SPEAKING OF MAN.

Even the "new woman" admits he is "a good thing to have in the house."

SPEAKING OF BOILERS,

The new and up-to-date Steam Fitter must admit that the

"PAGE"

is a "good thing" to have in *any* house. Users say so—*they ought to know.*

WHY NOT CORRESPOND?

W. C. MOWRY, Lock Box 314, Norwich, Conn.

HIGH GRADE HEATERS

Vertical Circulation, Horizontal Fire Surface.

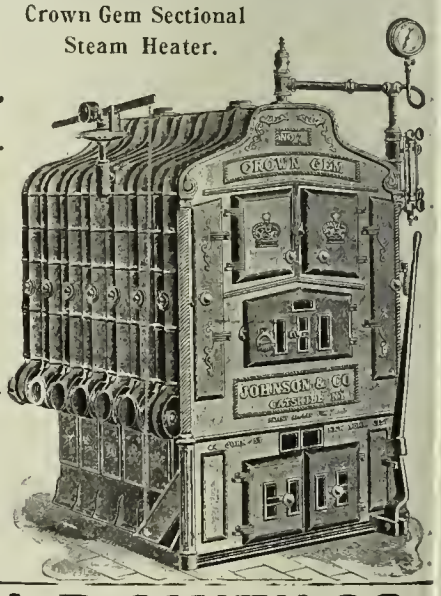
For Modern Houses.

STEAM AND HOT WATER!

These Heaters have large heating capacity and are economical in consumption of coal. Send for Cat.

JOHNSON & CO., 84 JOHN ST., N.Y. City.

Crown Gem Sectional Steam Heater.



Cottage Boiler.

THE H. B. SMITH CO.,

Manufacturers of STEAM AND WATER

Heating ❋ Apparatus,

FOR PUBLIC AND PRIVATE RESIDENCES.

SPECIALTIES:

RADIATORS: Union, Royal Union, Champion, Imperial.
BOILERS: Mercer, Gold, Cottage, Mills.

ADAPTED FOR STEAM OR WATER.

Salesroom: 133-135 Centre St., N. Y.
Send for Circular. Foundry, Westfield, Mass.

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GRAFF & COMPANY
MANUFACTURERS
208 WATER ST.
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HERO
HOT BLAST,
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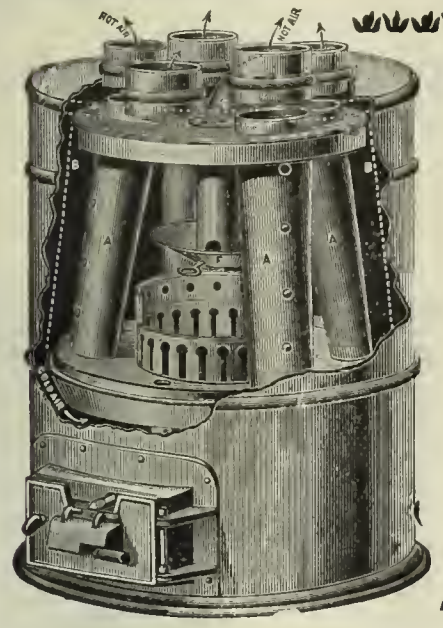
RIVAL AND DREXEL
GREATEST VARIETY.
MOST GOOD POINTS
FOR ALL KINDS OF FUEL.

STANDARDS OF EXCELLENCE.
BEST OF WORKMANSHIP.
MOST ECONOMICAL IN FUEL.
BEST IN HEATING QUALITIES.
FAULTLESS RANGES
THE VERY BEST.
GET OUR CIRCULARS & PRICES



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THE POSITIVE FURNACE.

Gas Tight, Economical, Durable, Low Down (height 4 ft. 7 in. when cased).

MEDIUM PRICED.

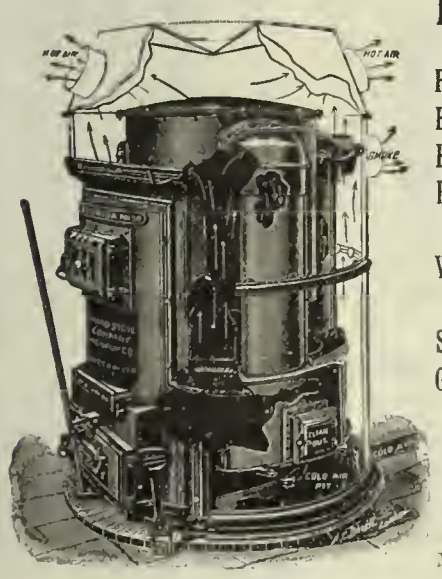
Every pipe delivers warm air equally, regardless of direction of the wind. Independent fresh air supply carried direct from the cold air reservoir through the combustion chamber.

MANY SPECIAL FEATURES

all thoroughly tested in actual use. Send for prices and testimonials. It will pay you to look it up.

THE TURNER HEATER CO., Bristol, Conn.

THE FAMOUS FLORIDA.
FOR COAL.



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Revertible Flues.
Extra Large Radiator.
Heavy Fire Pot.
Revolving or Flat Grates.
Very Large Ash Pit Door.
Spacious Ash Pit.
Gas and Dust Proof.
Efficiency in Heating.
Large Radiating Surface.
Easy Access to Radiator.
Durability Unsurpassed
Made in 3 Sizes.
38-50-60 Inch Fire Boxes.

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THE FAMOUS MAGNET.
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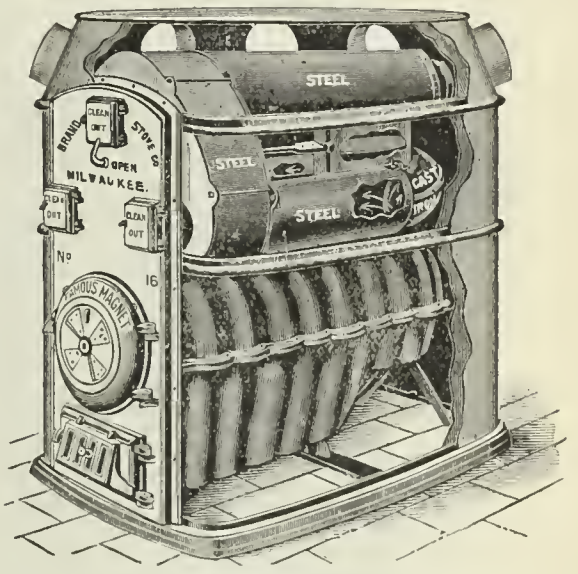
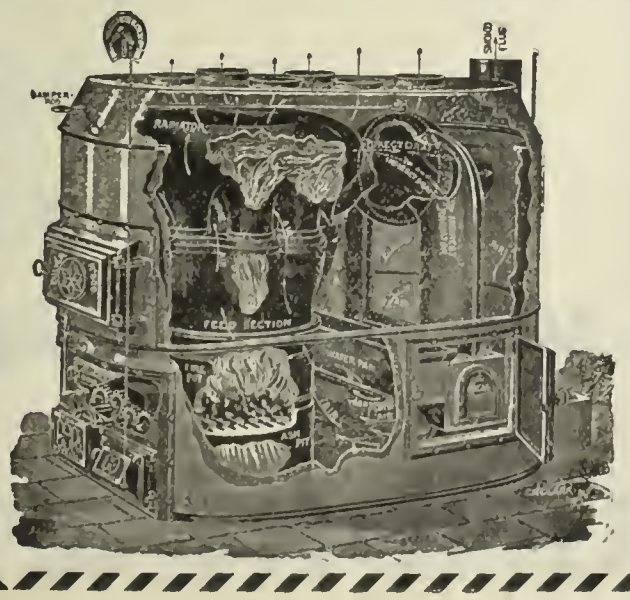




THE SIMONDS FURNACE CO.,

SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,

No. 50 CLIFF ST., NEW YORK,

Manufacturers of the Celebrated

"CULVER AND MONTANA FURNACES."

Double and Single Oven Ranges, with special features and latest designs.

STEAM AND HOT WATER BOILERS.

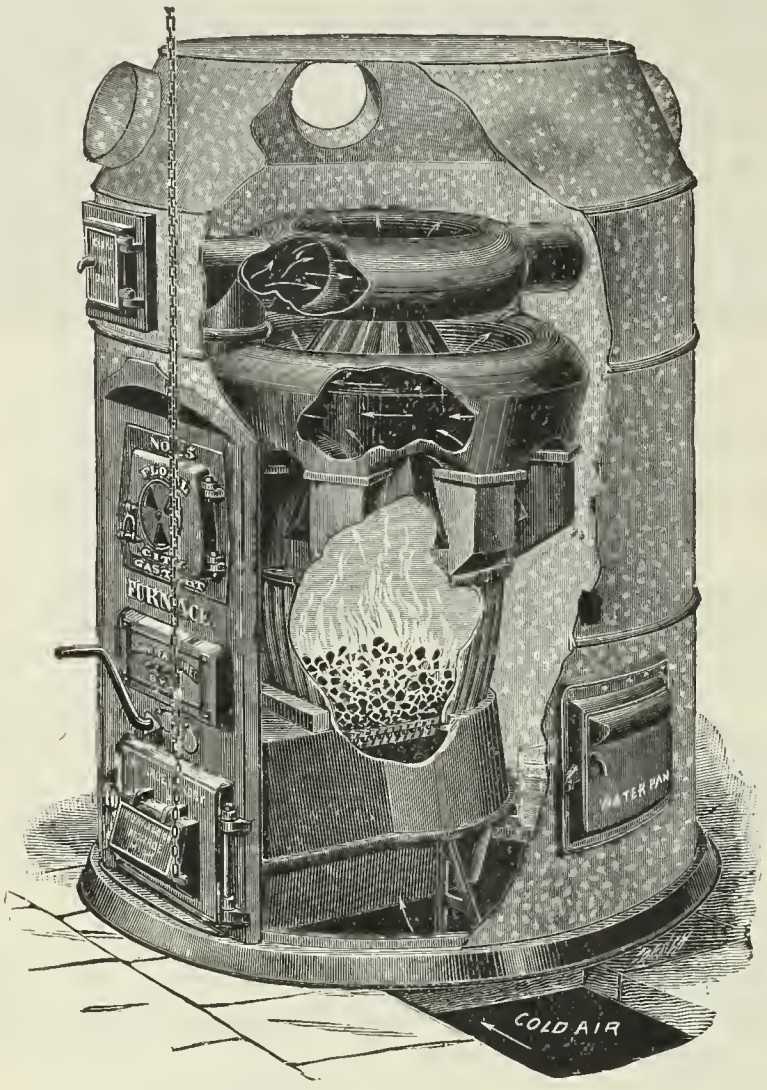
Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

Send for Catalogues and Prices.

A FEW OF THE FLO

WARM AIR AN
WARM AIR A
FUR

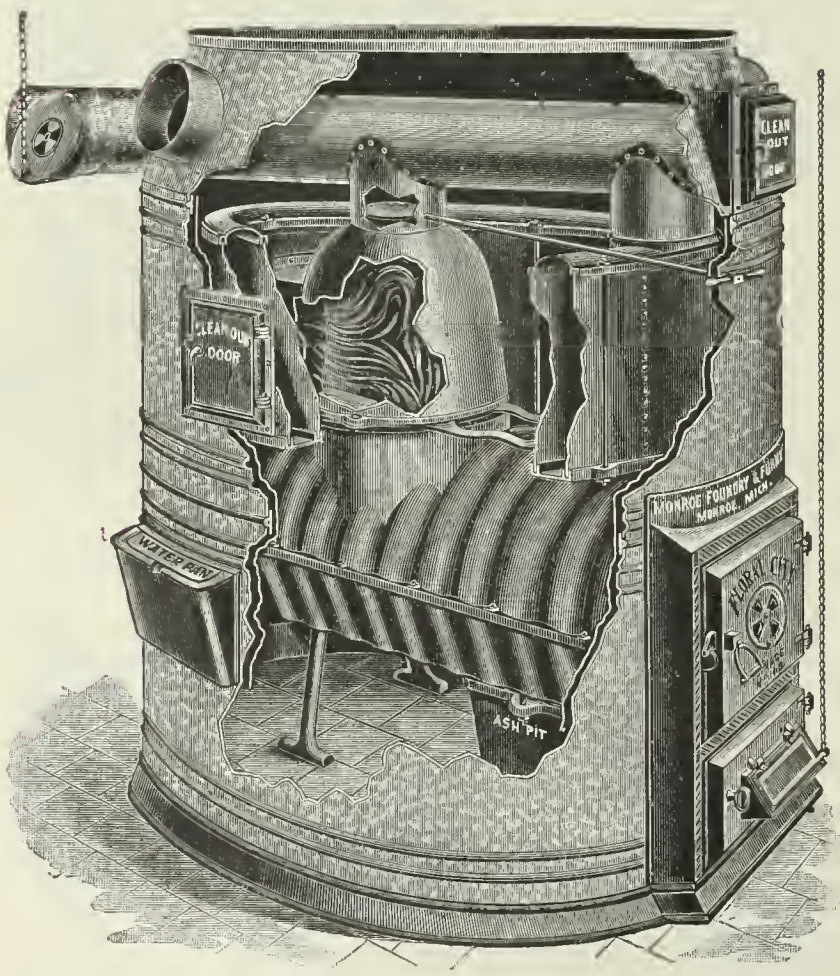
Of Many Sizes and Patterns



FLORAL CITY GAS TIGHT.

Every Furnace Guaranteed.

FLORAL CITY



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LIVE AGE

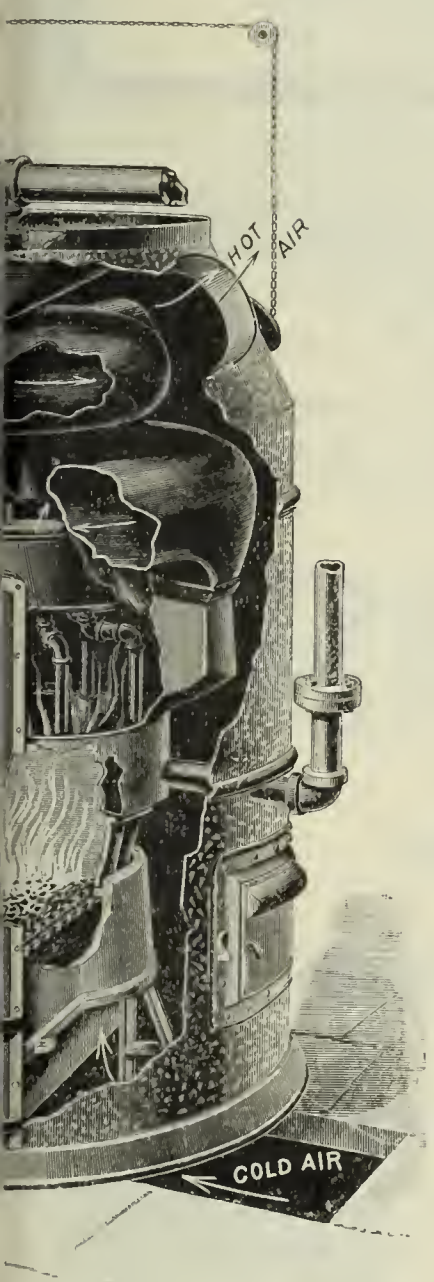
Write for Catalogue,

MONROE FOUNDRY & FU

RAL CITY FURNACES.

COMBINATION
D HOT WATER
ACES

Portable or Brick Set.



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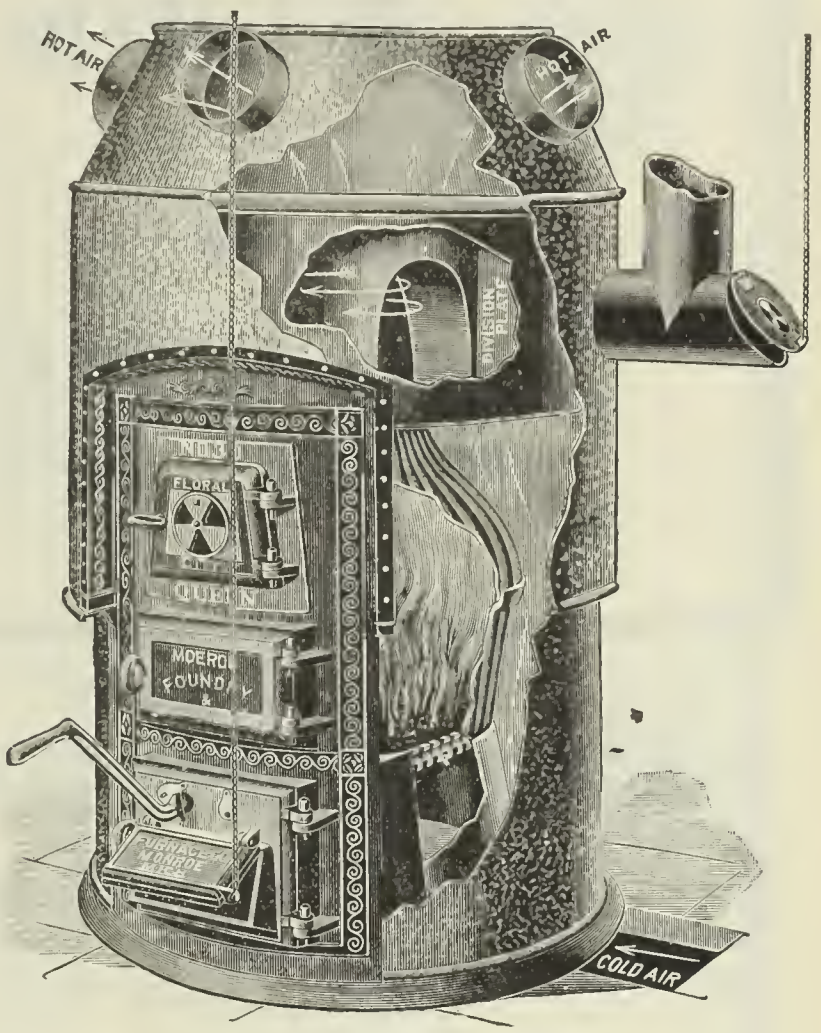
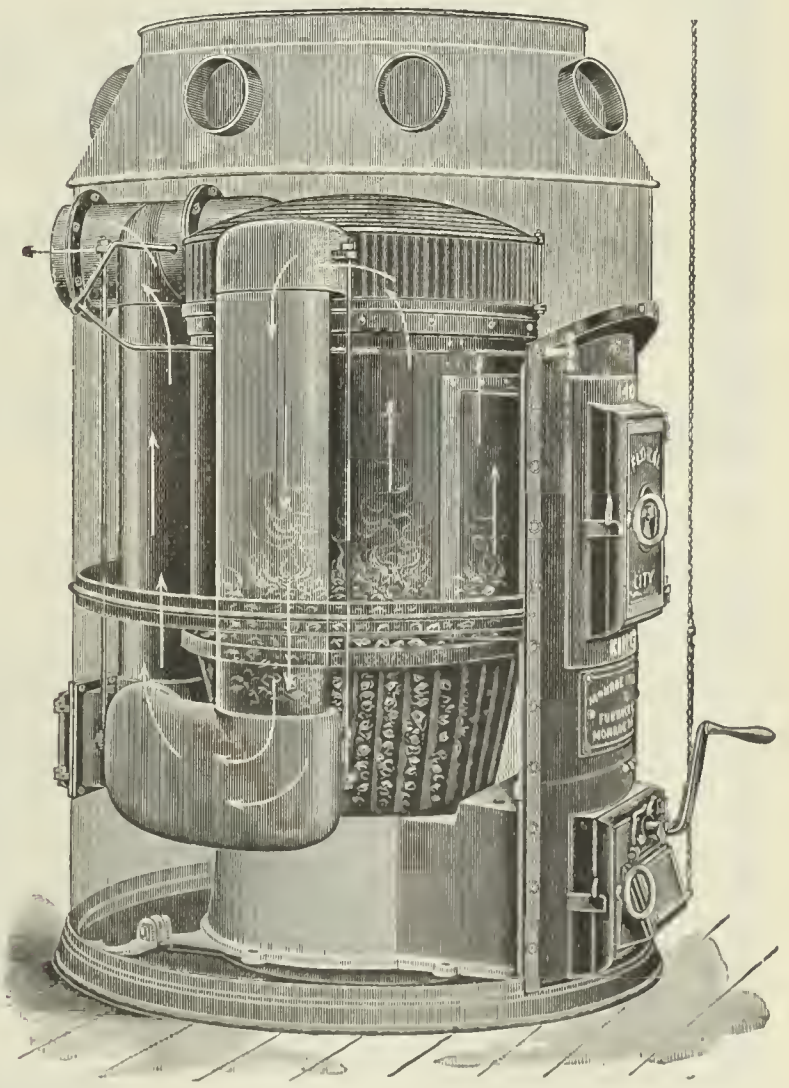
S WANTED.

rice-List and Discounts.

Simplicity, Durability, Economy.



FLORAL CITY QUEEN.



FLORAL CITY KING.

RNACE CO. Monroe, Mich.

A Little Horse

sense applied to the question of furnace heating will demonstrate the fact that good hot air pipe is as much of a consideration as a good furnace, **poor piping means much waste.** If you concede this let us send you catalogue of **Furnace Pipe** constructed on scientific principles, a **money, time** and **labor** saver. Look into this matter, it will pay you.

SAFETY FURNACE PIPE CO.,

Nos. 11 and 13 E. Atwater St., Detroit, Mich.

You may miss a contract

if you are not posted in regard to the merits of the Fowler & Wolfe Improved Wall and Steam=ship Radiator.

This is the Radiator which can be made any number of sections long, and in a variety of forms. It affords 3 ft. of efficient heating surface to 1 sq. ft. of wall surface, takes up very little more room than a base board, is exceedingly handsome in appearance, and may (the surrounding surfaces as well) be dusted with a feather duster. Is it any wonder that Architects and Heating Engineers are specifying it for use in the best contracts?

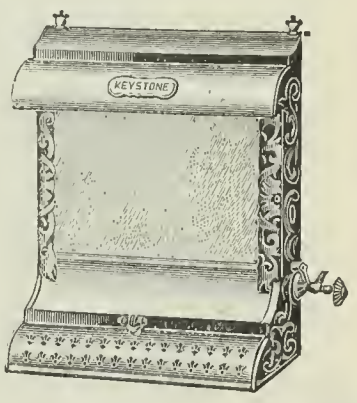
Drop us a postal and we will send you our illustrated catalogue.

FOWLER & WOLFE MFG. CO.,

664 BOURSE BUILDING, PHILADELPHIA.

—AFTER JULY 4 the convicts with a good record in the Kansas State Penitentiary will wear suits of cadet gray instead of striped suits. In referring to the matter the warden of the Penitentiary says: "I believe the change will have beneficial results. When I made the announcement to the men of the proposed change they seemed highly delighted with the prospect. Since that time I have observed a difference in the demeanor of the prisoners, and the class of offences has been of a more trival character. The stripe is older than the penitentary in this country. It came across the ocean. The lockstep came with it. We associate both with the penitentiary, and in the public mind the chief mark of disgrace in going to the penitentiary is the donning of the stripes. The convicts know this and hence the opportunity to keep out of them is seized upon by all men sent to prison, especially by men who still possess hope and ambition to be something better than convicts."—*New York Tribune.*

NATURAL GAS APPLIANCES.



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Gas Stoves,
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Gas Lights,
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Supplies for fuel and illuminating gas.

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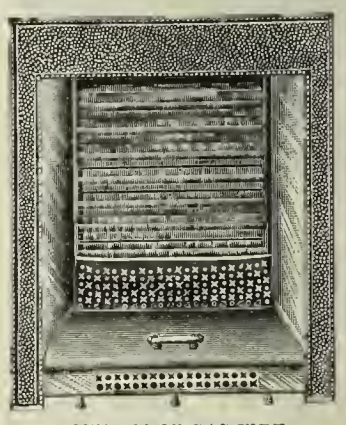

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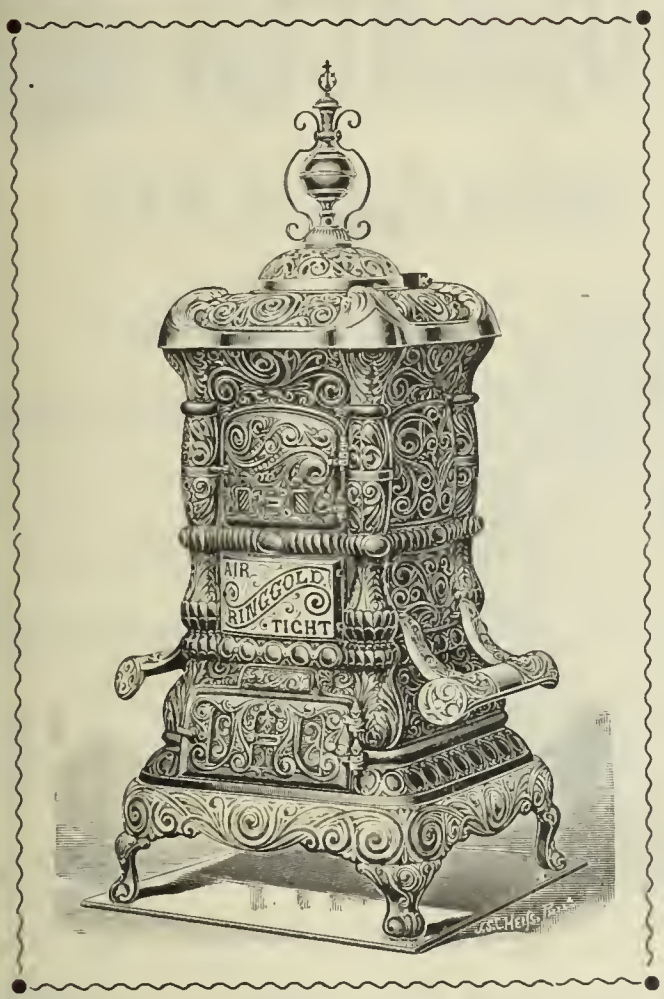
Reineke, Wilson & Co.

13 and 15 Wood Street - - - - PITTSBURG, PENNA.



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We Know You're Tired

of that never ending string of "Air Tights," all made after one homely design. Refresh your stock and your trade with the

—RING GOLD—

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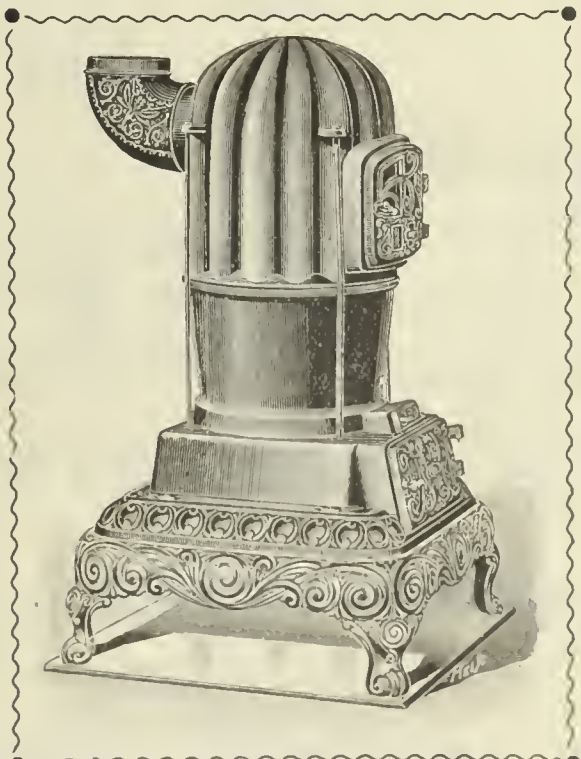

The DESIGN is BEAUTIFUL.

The FIRE POT is STRAIGHT.

The DOME is HIGH and CORRUGATED.

The DOME is ONE PIECE.

The SMOKE PIPE leaves the BACK.

The HEAT PIPE does NOT INTERFERE with the SWING COVER.

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WARM AIR FURNACES

FOR

HARD COAL, SOFT COAL AND NATURAL GAS.

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KERNAN Combination.

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A FURNACE the STYLE and PRICE OF THE

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is what you've always looked for.

Easy to BUY. Easy to SELL.

DETROIT FURNACE & HEATER CO.,

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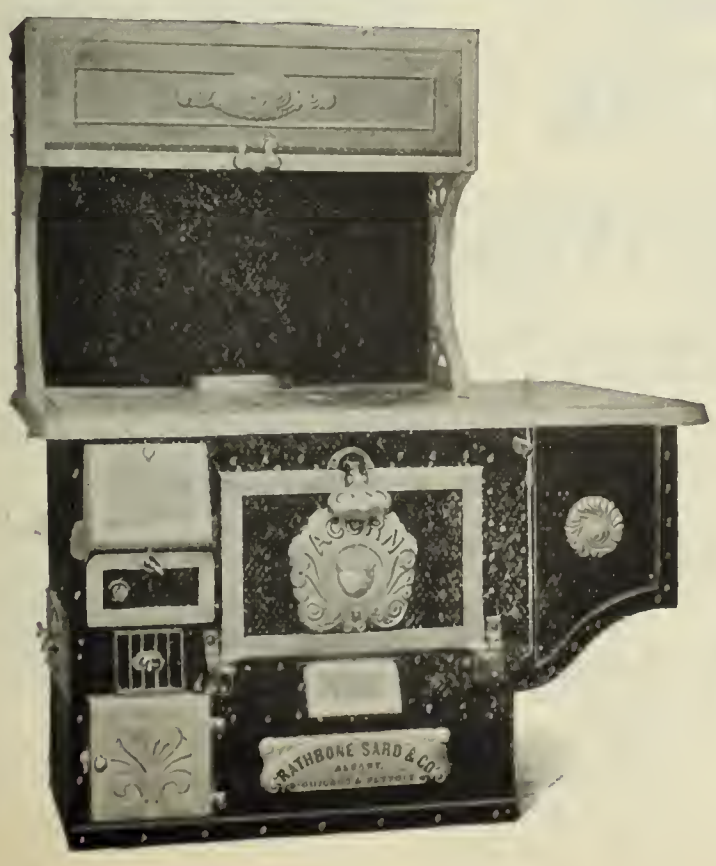
The Active Acorn.

A Specialty Without an Equal.

Thousands of these ranges have been sold since its introduction this spring. At times it has been difficult to fill orders, so great was the demand.

We claim for the Active Acorn that it is a sure and quick worker; more durable than any cheap steel range. Is easily repaired when necessary. Has a great number of selling features. Will not get broken or damaged in shipment, and is the handsomest and quickest selling range ever made.

Remember, the Active Acorn is not a steel range. It is made of heavy cast plates, with a steel oven. It resembles steel ranges in its shape only.



Prices are about the same as are charged for common sheet iron ranges, and the Active Acorn will outlast three or four of these inferior patterns.

If you don't sell it you are losing valuable trade.

Rathbone, Sard & Co.,

Albany, N. Y. Chicago, Ills. Detroit, Mich.

Eastern Foundries, ALBANY, N. Y.
Western Foundries, AURORA, ILLS.

Ferrosteel Registers

UNEXCELLED FOR

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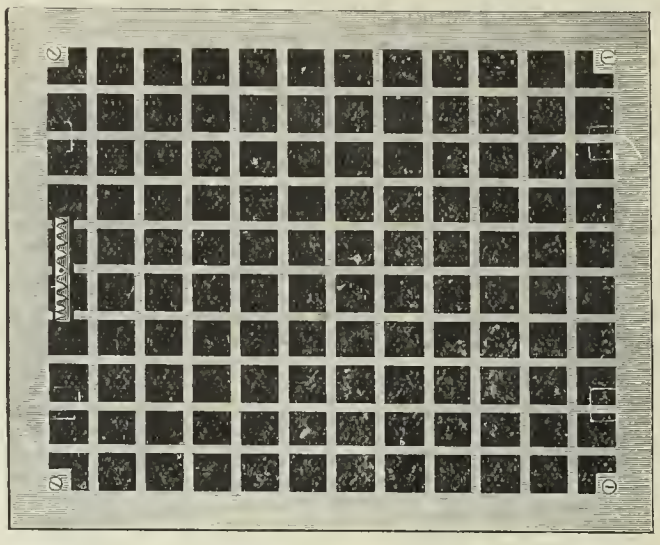

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FULL :: STOCK CARRIED.

NET ESTIMATES ON SPECIAL JOBS SUBMITTED.

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The Calovit Heating Company,

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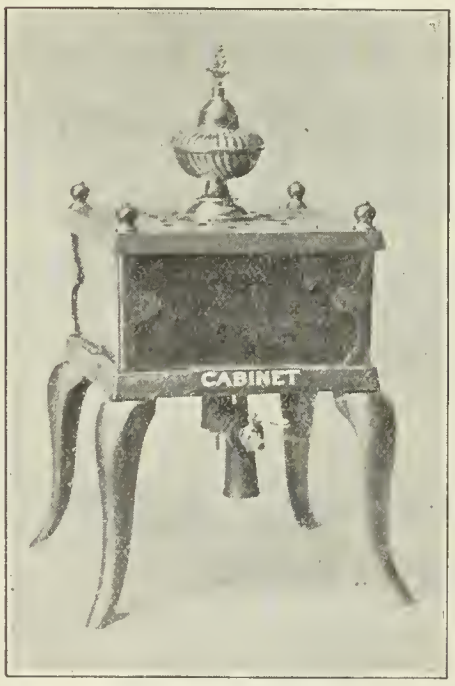

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Our Calovit Stoves are unexcelled for natural and manufactured gas.

Our Calidus Stoves are the best and only downward radiators ever made for natural or manufactured gas.

No Flue Connections or Special Fittings Required.

Double the Heat. ∴ Half the Gas.

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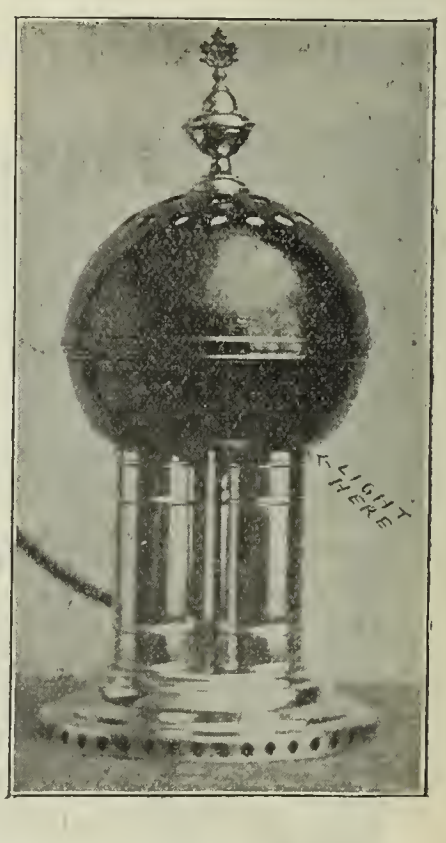

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ONE POUND—4 SIZES.

¼ lb. Each Size.

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Montana, · · 1.90		

TWO POUND—8 SIZES.

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North Carolina, $4.25	2½ x 3¼	2¾ x 4
Wyoming, · · 3.70	2 x 4	2½ x 4
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¼ lb. Each Size.

North Carolina, $6.00	4 x 5½	3 x 4
Wyoming, · · 5.10	2¾ x 4¼	2½ x 3½
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	2¼ x 4½	2¾ x 2¾
	2½ x 3	2¾ x 3½
	2 x 3½	5 x 7

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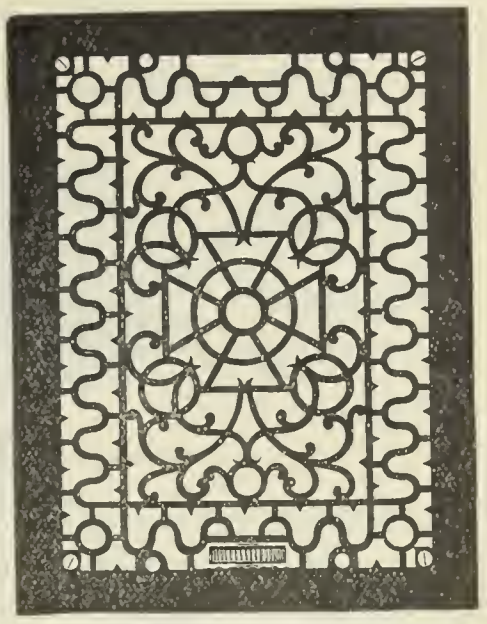

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PRACTICAL HINTS

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JOINT WIPING,

FOR BEGINNERS IN PLUMBING.

With thirty-five illustrations; 43 pages.

Paper, 25 Cents.

This book contains a reprint from *The Metal Worker* of two articles on the method of joint wiping, an operation calling for a very large degree of manual skill. The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions. The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners. Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used. The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

Sent, post-paid upon receipt of price, by

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PUBLISHERS,

232-238 William St., New York.

—MIXED IN HIS METHODS.—The absent-minded man continues to do things that add to the general merriment of the world and his own chagrin.

A case in point is that of a Boston father of a "wool-gathering turn of mind," who entered a grocery store with his baby on one arm and a kerosene can in his hand. Setting the can down on the counter he said, gently:

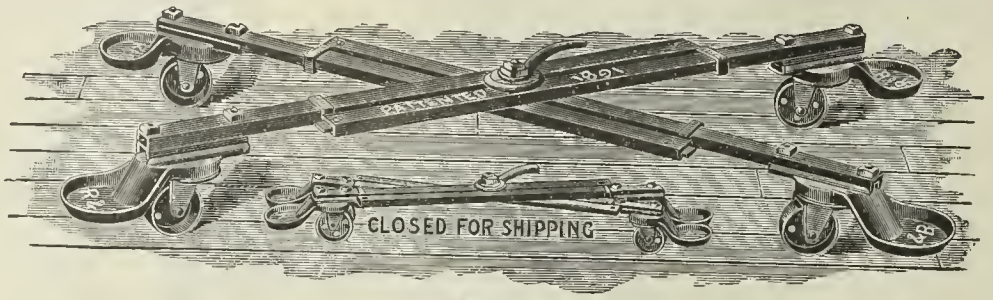
"Sit there a moment, dear;" and, holding the baby out to the dazed clerk, he said:

"A gallon of kerosene in this, please."
—*Harper's Bazar.*

READ THIS OFFER!

We will send one or more of these Stove Trucks on trial for a month and take them back if not satisfactory.

THE ONLY TRUCK THAT DOES NOT SHOW UNDER A STOVE



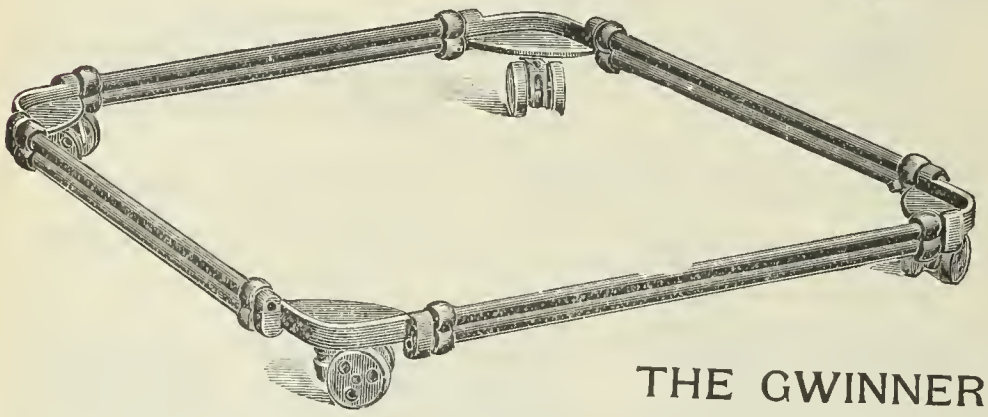
OR RANGE OR RAISE THEM HIGH FROM THE FLOOR.

PRICE, $16 Per Dozen.

It is literally out of sight, and consequently does not detract from the appearance of the stove or range upon it or make them look awkward or ungainly, as all other trucks do.

THE S. M. HOWES CO., - - 40-46 Union Street, Boston, Mass.

COMMON SENSE STOVE TRUCKS



Are easily and quickly adjusted to carry any stove. Made of wrought and malleable iron, will last a lifetime. Every stove dealer needs them. For Catalog and Special Discounts address

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Stove Truck
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MADE IN THE BEST MANNER
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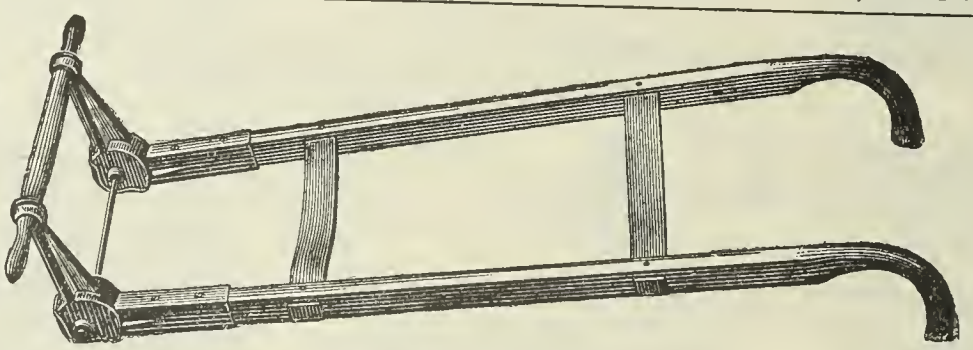

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HANDLED BY ALL LEADING JOBBERS.

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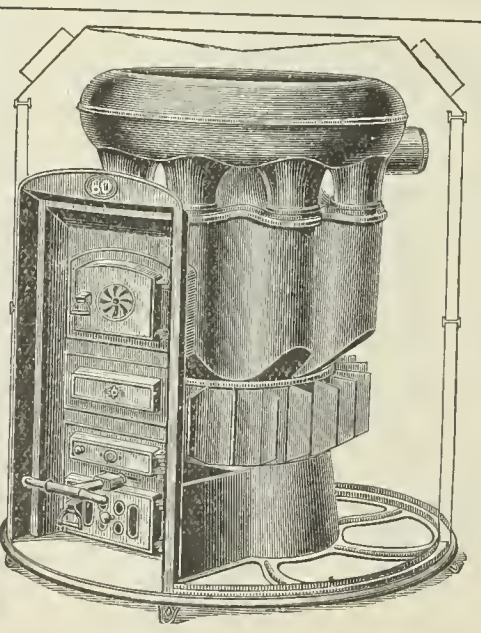

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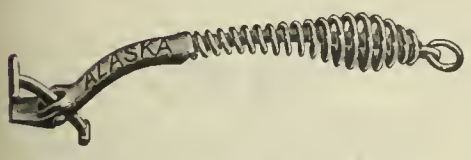

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Buy the original and
GET THE BEST.

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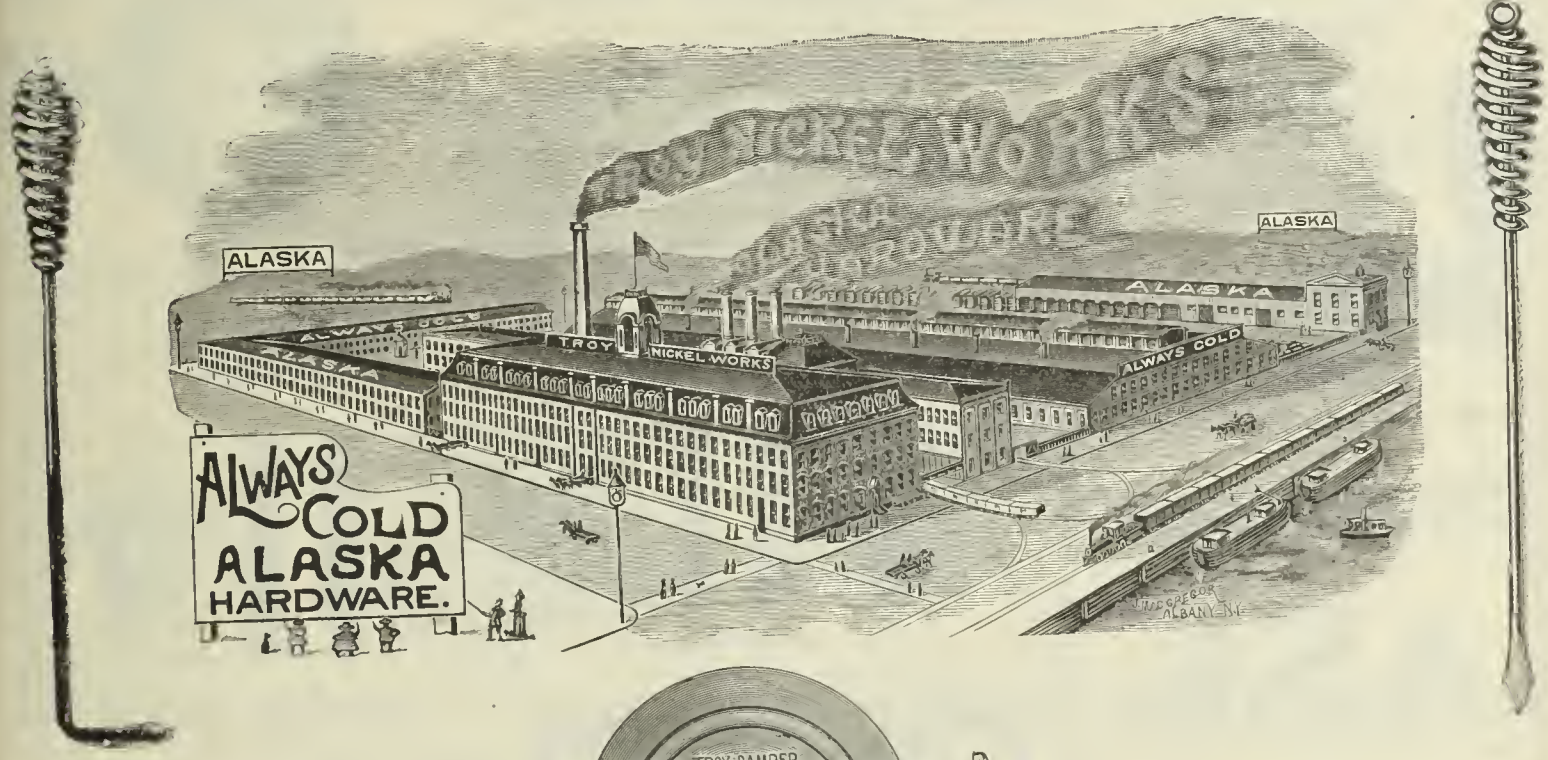
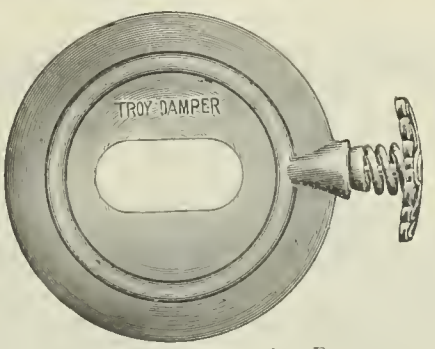
Lid Lifters, Pokers, Shovels, Fire Sets.



PIPE DAMPERS.



This is not as old as other Dampers, but it's getting there just the same, and re-orders proclaim the fact that it's liked by the users. Made in all sizes. "Handle Nickel Plated."

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N. B.—Having bought the entire line of Patterns of Perry Stove Co., we are in position to furnish *ALL REPAIRS* for this make of Stoves.

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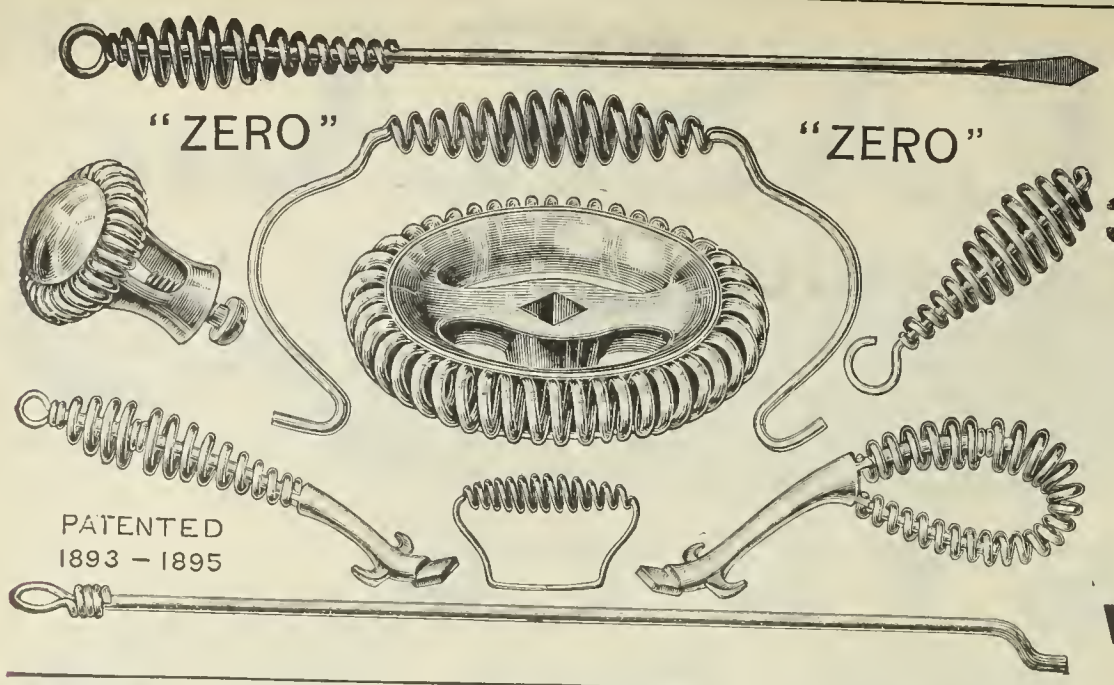

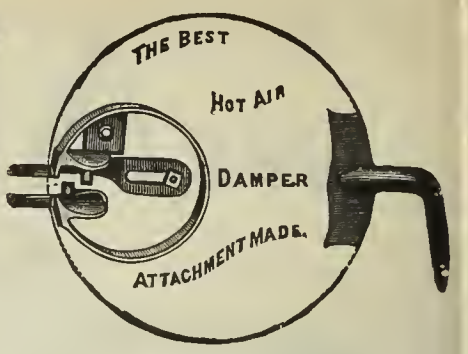

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WAFFLE IRONS.
The Best for Gas or Gasoline Stoves. Easy to Clean. Long Wood Handles.
Buy no Other.

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"ERIE" ALUMINUM CAST WARE,
The finest ware ever made. It will pay you to handle it.
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BUY ONLY THE AMERICAN.

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THE
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Made to order for STOVES, RANGES and FURNACES by
CINCINNATI PATTERN WORKS,
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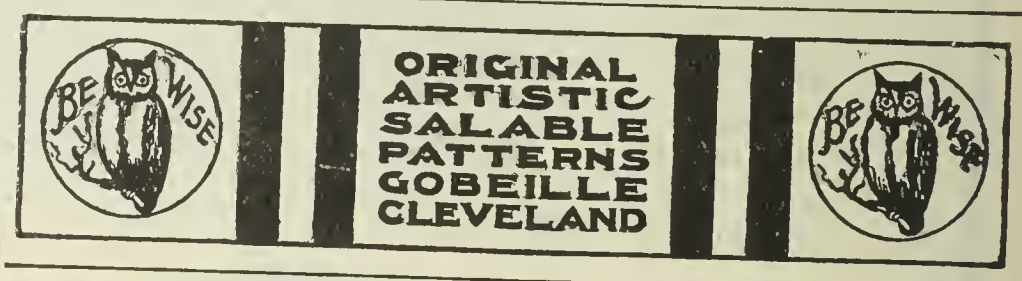

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—PROMISING YOUTH—"Here," roared the old judge to the son studying law with him, "you told me you had read this work on evidence and the leaves are not cut."

"Used X-rays," yawned the versatile son, and the judge chuckled with delight as he thought what a lawyer the boy would make.

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Our Business was burned out Sept. 28th, BUT

You Cannot Burn Out Banner Stove Lining.

We can give PROMPT SHIPMENT.

Bulk bbls. with printed bags included for sacking, $20.00 per ton, 1c. per lb.
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Promptness in Filling Orders Guaranteed. Send for Latest Catalogue.

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AND ALL OTHER PARTS. ORDERS SOLICITED.
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CUPOLA LININGS A SPECIALTY.
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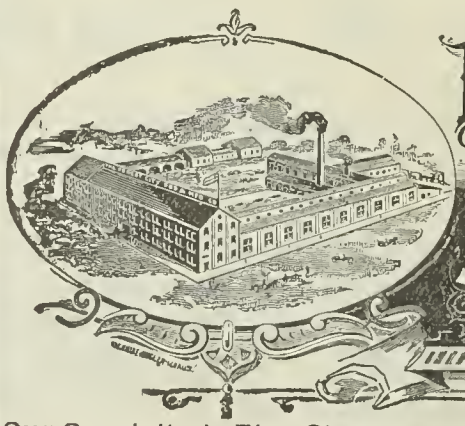
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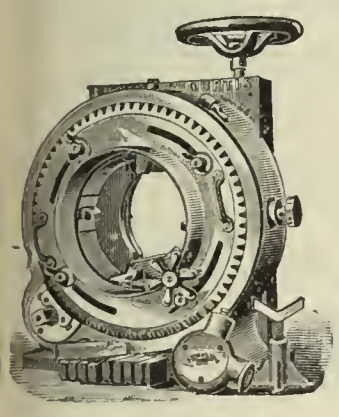

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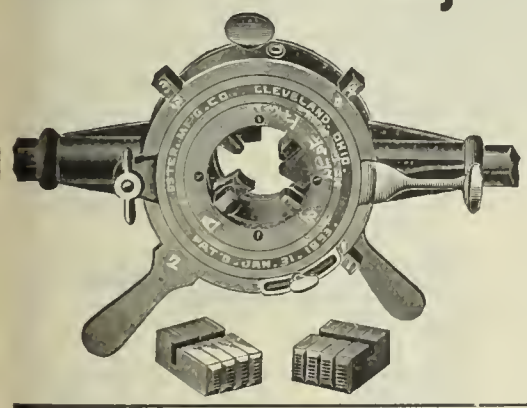

The latest Invention in Pipe and Bolt Threading Tools.

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No others will.

They have correct construction; are made of the best material; are easy to operate. A fulcrum clamp Sets and holds the Dies as rigid as solid Dies. Adjustable Guides center the work to the Dies. They have no equal. Warranted in all respects.

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Will do more work, give more satisfaction, is ready for use quicker, gives a stronger heat than any other, besides being free from odor, noise or smoke. Write the manufacturers and get one.

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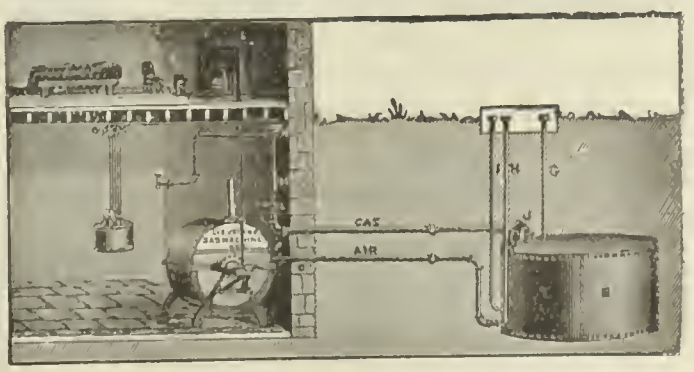
We manufacture an Improved **GAS MACHINE** for lighting surburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engines.



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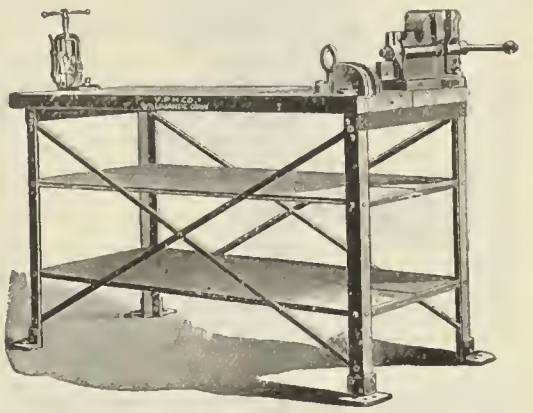

Consisting of

Steel tool chests, steel frame portable work bench, pipe bending form, leak stopper, cast iron pipe cutter, lead pipe cutter, asbestos joint runner, combination vise for holding brass and nickel plated pipe, combination portable shower bath, bath tub seat without metal parts combination bench and pipe vise, malleable iron hinged vise with bending forms, lead pipe bender, plumbers' pocket estimate book and other specialties.

Manufactured and for sale by

THE VANDERMAN PLUMBING & HEATING CO.,
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The Water Column.

A water closet of the highest grade operated by the

KENNEY
Slow-Closing Valve.

Operates perfectly under the highest pressures.

NO TANK,
NO BALL COCK.

THE
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Sanitary Mfg. Co.
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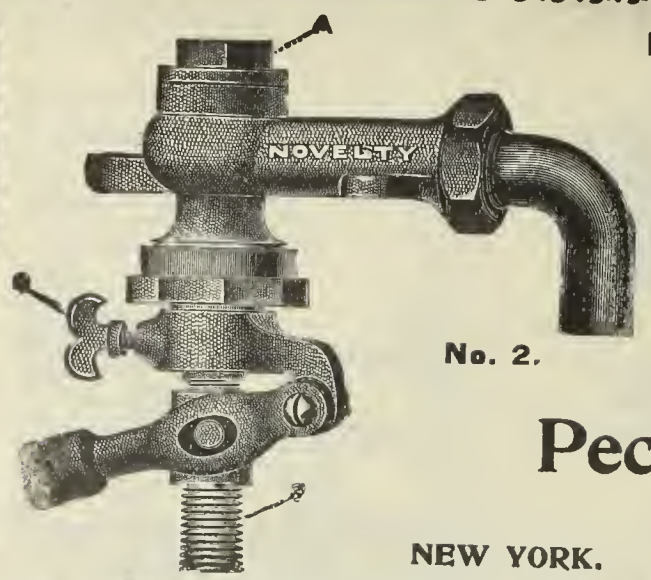

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Top Supply. Made also for Bottom Supply. Noiseless. For High or Low Pressure. Easily Repaired. Write for Prices.

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The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating or Welsbach burners.**

It is a modern, perfected apparatus, warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adustable burners. Send for catalogue.

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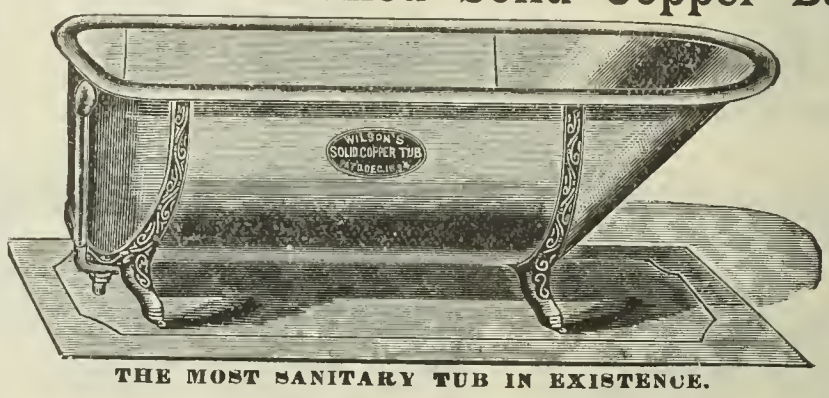
TIME IS MONEY!

Therefore waste no more time in looking further when we have just what you want,

A Double Seamed Solid Copper Bath Tub,



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The only one upon the market.

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Leather and Rubber WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

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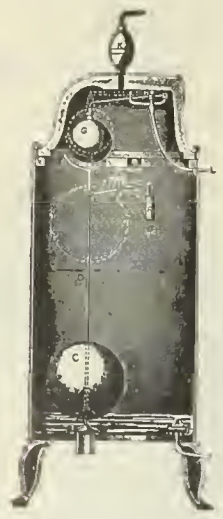

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I. X. L. Automatic Beer Pump.

Every Pump Guaranteed

Makes from 13 lbs. to 15 lbs. of air pressure in 4 minutes with one discharge of 10 galls. of water.

NOTHING TO GIVE OUT.

Muddy Water Don't Affect It.

The best, the most reliable, and the speediest pump on the market.

Very economical where water is supplied by meter system. Send for a circular. Agents wanted.

THE I. X. L. BEER PUMP CO.

Sole Manufacturers,

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—THE—

KELLY SHOWER BATH RING

Patented April 30, 1895.

It Will Produce Better Results Than a $100 Shower Bath.

For particulars write

Thos. Kelly & Bros.

Manufacturers of Permanent Plumbing Goods

201 Madison St., CHICAGO.

New Style.

OUR PATENTED IMPROVED

Broughton Self-Closing Basin Cock.

No exposed working parts.

Every intelligent plumber will appreciate this.

The Broughton work has been in use many years.

Unsurpassed for strength and durability.

Every one warranted.

Write for Circular and Price-List.

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Factory at Brightwood SPRINGFIELD MASS.

THE SIMPLEX ROASTER

An article which is in demand at this season of the year.

Practical, Durable, and Serviceable.

No. 08, 10 x 15 x 6½ in.

No. 09, 12½ x 17½ x 6½ in.

WITH OR WITHOUT

RACKS.

Made of smooth finished, cold rolled steel, with a fastening device in the handles (not shown in above cut; which draws together and securely fastens the two Pans, making a Roaster which is beyond criticism. ***The best low priced Roaster in Market.***

WRITE US FOR PRICES.

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DON'T PEEL POTATOES!

This is the Emancipation Proclamation that sells the

HENIS PRESS

Lightest, Handiest, Cleanest and Most Durable of all Kitchen Utensils.

NO MORE PEELING and POUNDING POTATOES.

IT PEELS AND MASHES WITH ONE STROKE.

A Fruit, Vegetable and Jelly Press, Colander, Strainer, Lemon Squeezer and Potato Masher.

Weight, 16 ounces. **Length, 10 inches.** Can be sold in all seasons.

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Sperry's Steam Kettles.

Made from very thick metal, without Stay Bolts, Joint packed in such a manner as to never need repacking. A little higher-priced than some, but they are safe and tight.

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YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing

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HANDY DIE STOCK.

GREAT FOR JOBBING WORK.

It is easily and quickly adjusted and holds dies ranging from ⅛" to ¾" I. S., and ⅜" to ⅞" F. T., inclusive.

Being but 15 inches long and weighing less than 3 pounds it is easily carried with other tools and no plumber's kit is complete without one. The price puts it within the reach of all.

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Manufacturers of

LEAD PIPE, SHEET LEAD, SHOT,

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Everything You Want for Plumbing.

PLUMBERS' TEXT BOOK.

Miscellaneous Tables, Questions and Answers on the Principal Topics of Interest to the Craft. Also a Dictionary of Terms of Value to a Plumber.

BY F. W. TOWER.

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—In Venice not long ago a lottery drawing gave rise to the opening of coffins in order that the sign of a lucky number might be detected in the eye or on the lips of the corpse. Shrouds dusty and covered with mould were examined for traces of writting that might lead to the sought-for knowledge, and new-born infants were closely inspected for birthmarks that would reveal the secret, while it is said that ladies of birth and education wore their dresses with the insides turned out, in order to propitiate the god of the wheel. In Naples a begging monk was fallen on by two footpads, who insisted that he should tell them the lucky number, and on his assurance that he was not able to do so they beat his so severely that he afterward died in a hospital. These expedients to steal the secret of Fortune display so much ingenuity that it would seem as if their practitioners might without much trouble make more money in other ways.—*New York Tribune.*

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23 and 25 Cliff Street, New York,

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House Furnishing Goods

SPECIALTIES IN

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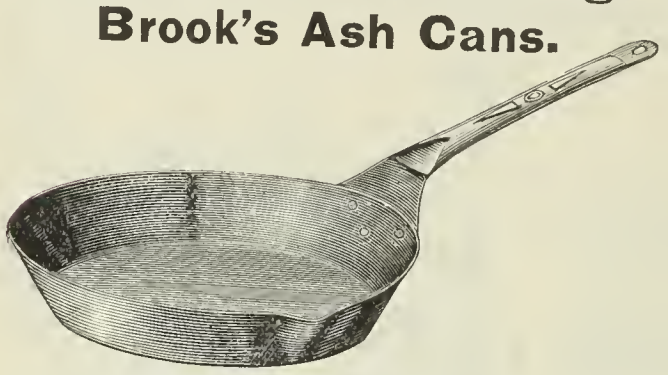

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New Price List,
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Proposals Invited.

LARGEST ASSORTMENT.
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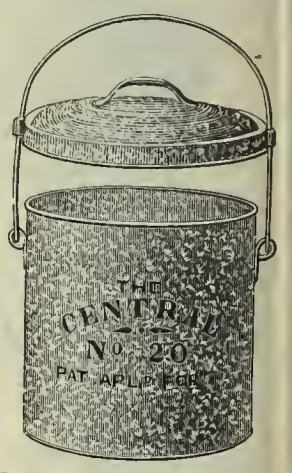
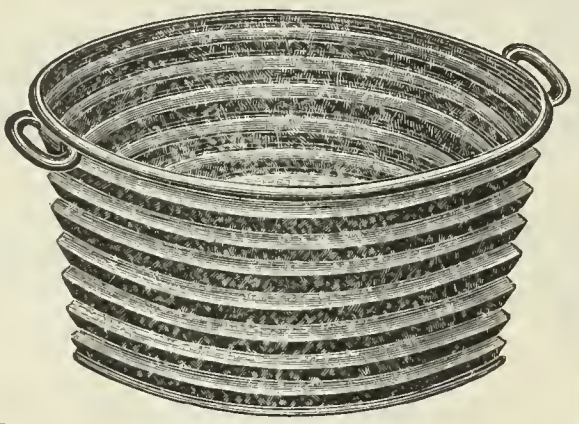


New Ash and Garbage Can.
Cover Always Attached.



FOUR SIZES.

Number	0	1	2	3
Diameter at top, inches,	20⅝	21¼	23⅛	24⅞
Diameter at bottom, inches,	16⅛	18	19⅝	21
Capacity, quarts,	44	52	62	71

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S & B

Galvanized AND Corrugated WASH TUBS.

(PATENT APPLIED FOR.)

Strongest, Best AND Most Handsome Wash Tub Made.

NO BUCKLING OR BENDING.

CORRUGATED ON BOTH SIDES AND BOTTOM.
SIDES MAY BE USED AS A WASH BOARD.

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Parlor Tea Kettle, No. 020, Nickel-Plated.

House Furnishing Specialties.

Royal N. P. Tea Kettles
[Patent Ears]
Are the Acme of Perfection.

Copper N. P. Tea and Coffee Pots
[Plain or Engraved]
Best Sellers on the Market.

IF YOU WANT A LEADER, try our **"BERLIN" POTS.** They are made of tin, nickel-plated, and compare favorably with the high-priced article.

METAL TRAYS in a large variety of designs.

Large assortment of Cuspidores, Crumb Trays and other useful articles. Our new catalogue is sure to interest you.

ROME MANUFACTURING CO.

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Makers of the

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STOVE FURNITURE.

Tea Kettles, Coffee Pots,
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LARD CANS

With Stamped Covers.

Gallons	4	6	8	10
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WILL NEST AND PACK CLOSELY.

Crated six each of two or more sizes nested.

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HARDWAREMEN=MORE MONEY

can be made by displaying your stock effectively. Learn how others do this by reading "**The American Hardware Store**"—a book full to overflowing of tried ideas and successful methods of hardware display and arrangement gleaned from hundreds of dealers. Three Dollars buys 450 pages, 500 illustrations and many money bringers.

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Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: *NEW YORK.* *CHICAGO.* *BOSTON.*

NEW All Iron, Galvanized

SAFETY

COAL SIEVE AND COVER.

Pat. applied for.

No wooden hoop or cover to break; will not rust, and is just the thing for HOT ASHES; and used on our SAFETY ASH BARREL is DUST PROOF.

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Also makers of a full line of Galvanized Sheet Iron Wares, Factory Fire Buckets, Oily Waste Cans, Garbage Pails, Chamber Pails, Coal Hods, Oil Cans, Ash Barrels, etc.

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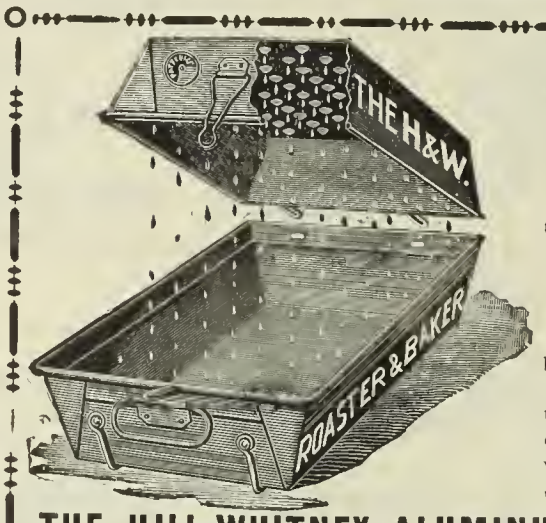

THE "H. & W."

The Only Perfect Self-Basting Baking and Roasting Pans.

The Latest improved and Most Perfect Pan in Use. Made of Planished Steel.

The Self-Basting "H. & W." also combines *all* the advantages of other pans its simplicity of construction enables the user to adjust and handle it readily; very durable and easily cleaned. The *only* Pan with *Indentations in the Top, making Self-Basting Positive.* See cut.

THE HILL-WHITNEY ALUMINUM CO., - - Boston, Mass.

High Grade Enamel Ware.

This Trade Mark on bottom of each article.

DOUBLE COATED and ABSOLUTELY PURE

AGATE NICKEL-STEEL-WARE L & G MFG. CO.

Contains no ARSENIC, ANTIMONY, LEAD or other poisonous ingredients.

Others may claim purity, we alone substantiate it by chemist's certificate attached to each article.

"We have made a critical examination of the products of nearly a score of the manufacturers of such goods, and the only articles of the kind found to be absolutely free from all the dangerous contaminations of which mention has been made are those known as 'Agate Nickel-Steel Ware.' The makers of this ware possess an exclusive patented process by which, through the intervention of a coating of nickel, the impervious or enamel coating is caused to adhere to the steel, thereby doing away with the necessity of a lead bath or the employment of antimonial or arsenical preparations to achieve such results."—C. H. Brace, M. D., in *American Journal of Health.*

FOR SALE BY ALL REPUTABLE DEALERS.

Write for free booklet containing startling information about

ENAMELED COOKING UTENSILS

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KEEP YOUR HANDS CLEAN.

THE PARKS STOVE POLISHING MITTEN AND DAUBER

Is a great improvement over the old stove brush for blacking stoves, **without getting a speck of blacking on hands.**

The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth.

The Dauber is also made of sheepskin, with the wool on, and so shaped as to readily get the blacking into all crevices and corners. It is also adapted to polish russet and patent leather shoes, cleaning windows, furniture, etc.

MANUFACTURED BY

PARKS & PARKS, - Troy, N. Y.

—AN AMERICAN traveling in Jerusalem describes in "The Hartford Courant" a dinner he recently ate in Jericho. "We sat down on the porch of the hotel," he says, "after a dinner at which we were served with butter from Norway, cheese from Switzerland, marmalade from London, wine from Jerusalem diluted with water from the well of Elisha, raisins from Ramoth Gilead, oranges from Jericho (in no respect inferior to those from Jaffa or the Indian River, Florida), and almonds from the east of the Jordan, smoking Turkish tobacco, which, like the Turkish Empire, is inferior to its reputation, and a cup of coffee from—the corner grocery of Jericho."—*New York Tribune.*

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PATTERN BOOK.

A Treatise on Pattern Cutting as Applied to all Branches of Sheet Metal Work.

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The Most Elaborate and Complete Work that has ever been brought out for the use of Sheet Metal Pattern Cutters.

Printed from new type with a new and improved arrangement, especially convenient for reference and study.

Parts of the former treatise, entitled The Metal Worker Pattern Book, have been utilized in the preparation of this

GREATLY ENLARGED AND IMPROVED WORK,

but these have been REWRITTEN AND SIMPLIFIED, and later methods embodied which have come into use since the publication of the original work.

218 Problems are now given,
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The greatest care has been taken with the explanatory portions of the work, enabling the student, without any previous training in mathematics and drawing, to become a FINISHED PATTERN CUTTER.

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Tinners and Cornice Makers will here find elucidated every problem of ordinary occurrence, from the simplest to the most complex

Triangulation is here for the first time treated systematically and in a way to meet the practical needs of the trade.

The opening chapters are devoted to the preliminary information necessary to give the student a thorough understanding of the subject, treating the topics fully and with appropriate illustrations. The work is comprised in the following chapters:

I. Terms and Definitions—15 Pages,
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This work in its perfected form is a complete

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for Tinners, Cornice Makers and Sheet Metal Workers, all of whom should be provided with a copy.

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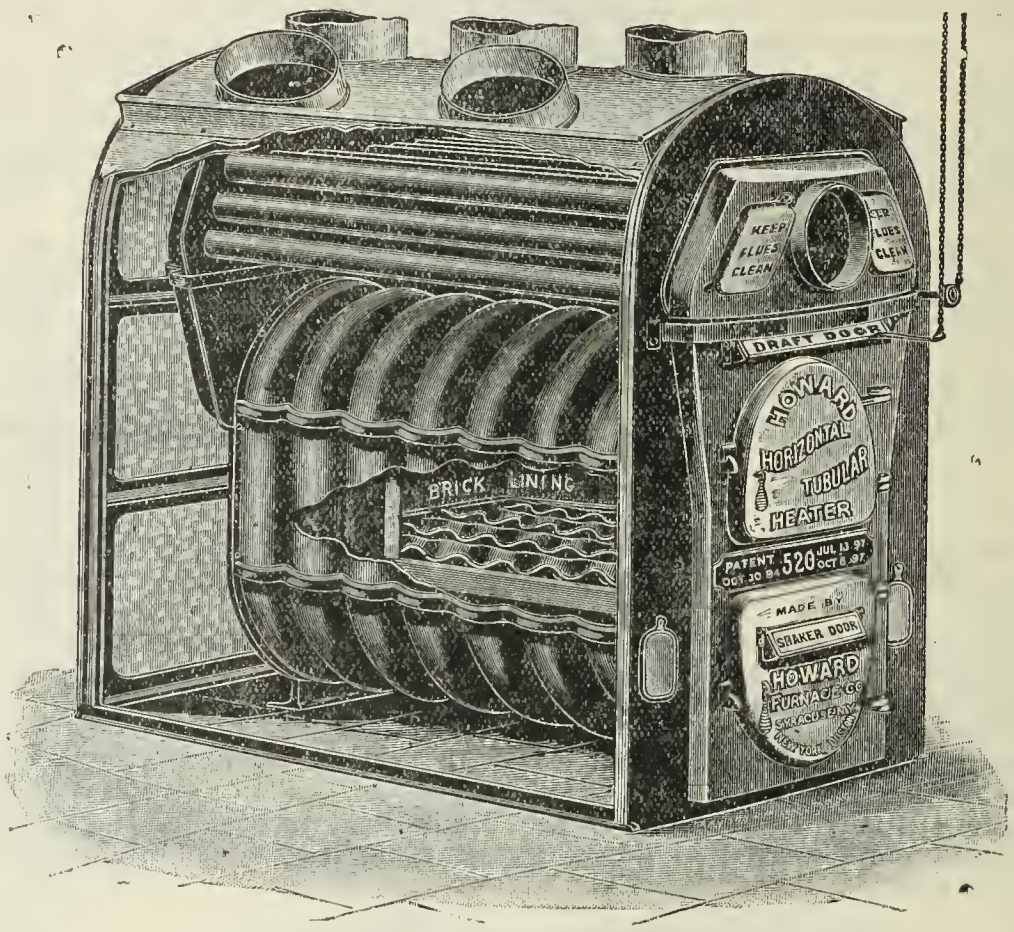
Dean Swift

Said:—"When a true genius appears in the world you may know him by this infallible sign—that all the dunces are in conspiracy against him."

it is true

Ignorance may talk as it will, but learning has its value. When anybody avoids a phenomenon, and refuses to pay it that attention which it deserves—science is protested, and truth is made a bankrupt. The mission of **science** is to study and try the depth of everything. It is never satisfied. It is everlastingly thirsting for information. It plays in progress the part of utility. Do you want examples? They abound. Here is one. Why not investigate this furnace? It is a phenomenon of concentrated heat qualifications, as the following description shows.



Patented: Oct. 30, 1894. July 13, 1897. Oct. 5, 1897.

tubular construction

in the first place splits the fire travel. That very thing retards the draft, and hinders the heat from wasting in the chimney. Not only that, these tubes occupy the entire air chamber of the heater. They pierce the air at a distance of one inch apart, so that at all times the "warmed air" is confined in close contact with the radiating surfaces. There are a dozen reasons in favor of this construction. Write us about it.

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, November 6, 1897.

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Index to Reading Matter.....Page 68.

The Business Situation.

In some respects the month of October was disappointing in its business results, as compared with the previous month. Sales did not quite total up to expectations, especially in the last two weeks. The reason generally accepted for the falling off was that many merchants stocked up thoroughly in September and did not need additional supplies. That this experience was not general, however, is indicated by the trade figures of last month, which showed an aggregate of clearings 6.1 per cent. greater than in October, 1892, and 28.9 per cent. above the figures for the same month last year. When it is recalled that the general level of prices is much lower now than it was five years ago, the inference is plain that a very large amount of merchandise must be changing hands and that buying must have been going on considerably in excess of immediate requirements. The West and Northwest has been probably the most favored region in the way of business activity. Reports from that section point to very free buying of manufactured goods by the agricultural community, who have been selling their crops at a handsome profit and paying off mortgages and back debts, and who now find themselves in a position to lay out their surplus cash in many of the necessaries and comforts of life from which they have been debarred during the former years of depression. For this reason, improvement in business is much more pronounced in the West than in the East. Trade in the South has suffered severely through the yellow fever scourge and the accompanying restrictions of quarantine, but the colder weather which has set in is already exerting a favorable influence there and orders from Southern points are coming in more freely. The comparative mildness of the weather interferes with the movement of winter goods in most parts of the country. But this condition cannot long continue now, and merchants and manufacturers are looking for a stimulated demand as soon as the first really cold snap occurs. Export business continues remarkably large, and its volume in both agricultural and manufactured products steadily swells. Last week's shipments of wheat from Atlantic ports amounted to 4,000,000 bushels and the total outgo of the cereal from this coast in October was over 14,000,000 bushels, against 9,800,000 bushels last year. The price of wheat advanced 3 cents a bushel this week, but cotton reached the lowest price in two years, on indications of a much larger crop than was expected. The money market is again very easy and commercial loans have much increased. Speculation in stocks was very narrow and professional, while prices of securities showed little change on the week's dealings. The metal markets have displayed little activity, but iron and steel manufactures are in good demand with prices unchanged but generally firm.

Nine Months' Building Operations.

The improved condition of general business as compared with a year ago is found to be reflected in some measure in the extent to which building operations have been conducted during the past nine months in this city and immediate vicinity. It is to be noted, however, that this improvement is not general throughout the country, as the conditions existing in the larger cities are entirely different from those which obtain in the villages and smaller towns, and while a fair degree of building aetivity may prevail in leading centers, complete stagnation may characterize the building business elsewhere. This can be explained in large part, if not altogether, by the fact that in the important eities there is always more or less doing in the way of new office buildings, business blocks, apartment houses, dwellings, &c., to say nothing of the immense number of alterations made every year, involving in the aggregate the expenditure of a vast sum of money. The extent to which this has been done is nowhere more apparent than in New York City, where during the first nine months of the year permits were issued for 2771 buildings, estimated to cost $66,207,665. These figures compare with 2558 buildings projected in the same period of 1896, estimated to cost $61,386,775, and 3131 buildings, estimated to cost $69,663,417, in 1895, which was the banner year in the building line in the history of the metropolis.

Learning By Reading.

BY I. SIGHT.

It all depends on how you read whether you get any benefit from it or not, was what the shrewd old fellow said to the few that had congregated in the shop discussing the value of trade papers. Some of the best workmen said that they had received great benefit in their work from articles in *The Metal Worker*. Some other men, who were notorious for always being in trouble over the jobs assigned them, growled that they saw no good in reading and didn't do it. The old chap took up a recent copy of *The Metal Worker* and said he would read it for them. On the last page he saw "Going Behind" and said the crowd that was doing it needn't feel lonesome, for it was a big one, and all because they didn't reason right. "Accurate and Rapid" next struck his eye and he smiled, saying that things were rapid enough, but there was a woful lack of accuracy in the way they were done. On the next page "Drop Hammers" caught his attention, and with no regard for relevancy he remarked that if they dropped harder and oftener in all trades business would be more profitable. "What every tinner wants" in his opinion was to have all of his competitors carefully esti-

mate the cost and then add a profit when bidding on work. "About this time of year," he said, trade was pretty brisk and money came in fairly well, but trouble came from people not preparing for the later winter months and the January settlements.

"Lead Washers" he thought referred to some workmen who looked as if they bathed in liquid stove blacking. "Galvanizing Works" suggested that many shops throughout the country should be so treated to see if it wouldn't bring some life. "They are soft, clean, well coated and easy to work" reminded him of men who succeeded to an old business with no knowledge of trade. "We want your business," this statement made by a man who spent his odd time in canvassing, would be far better than growling by the shop stove. "Popular because reliable" was a desirable condition, for no competition could succeed against it.

"Conductor Pipes" should lead from the people's pockets into the bank account of every well conducted business. "Look Here" he considered a good suggestion to the buyer who could often find profit in reading the ads. "Heads and Faces" are a proper study for every salesman, for his success in business depends on his success in reading them. He then skipped the middle pages and said: "It is plain enough" that reading and thinking pay. "Keep your hand clean" of tricky methods in business could be profitably obeyed. "Don't peel the potatoes" was a hint for a man inclined to be too close in his dealing to please his customers. When "All Cast Iron" caught his eye he said that means no sand or sand holes to pay for. "Put up expressly for the retail trade" had a smack that made some of the listeners wipe their mouths with the back of their hands and then look sheepish. "Must be seen to be appreciated" is a hint that a dingy salesroom kept in disorder will hinder the sales of really good bargains. "Please the People" should be the aim of all, from the boss to the errand boy, and if you have good trade you will know "That this does it."

"Now, my young 'Apollos,'" said the old chap in closing, "if your ears have been open you have been treated to a 'Side Feed' and 'American Seal' was on the label, and you should know that it is a libel to say what you did about reading. If I ever have to read this paper to you again it will be from the middle, where you will be further benefited."

The Franklin Institute and Smoke Prevention.

At its last monthly meeting the Franklin Institute concluded its exhaustive investigation of the smoke question. This task was undertaken almost a year ago at the request of the Board of Health with the view of assisting that body in the work of formulating a practicable ordinance for presentation to city councils regarding the elimination of the smoke nuisance. Acting upon the request of the Board of Health in April last, the secretary of the Franklin Institute sent invitations to prominent engineers and scientists in various parts of the country to be present and to contribute papers on the subject of "Smoke Prevention" at the meeting to be held in May. So general was the response and so numerous were the papers that the discussion was necessarily carried over to the next monthly meeting, and more than a score of speakers and correspondents discussed the subject from a broad, scientific standpoint. At the conclusion of the second meeting the following resolutions were offered:

Whereas, The Board of Health of the City of Philadelphia has requested the Franklin Institute to investigate the question of smoke prevention, and to offer practical suggestions relative thereto; and

Whereas, The use of bituminous coal is increasing in this city, and is likely so to continue in the future; and

Whereas, It appears from testimony of scientists and experts, presented at this meeting, by invitation of this institute, that it is practicable to burn bituminous coal in stationary boilers and furnaces without creating a smoke nuisance; therefore be it

Resolved, That it is the sense of this meeting that the continuous or frequent discharge of dense black smoke from the combustion of bituminous coal is unnecessary, and should not be permitted within the city limits.

Resolved, That a copy of these resolutions be sent to the Mayor, the president of the Board of Health and to the presidents of city councils.

After discussion the resolutions were referred to the Board of Managers of the Institute for their consideration and advice. The proceedings were then published in full in the "Journal" of the Franklin Institute in the June and July issues, together with an appendix containing the smoke ordinances of the cities of Chicago, Cincinnati, Cleveland, Pittsburgh, St. Louis, Detroit, Milwaukee and Minneapolis, and the State ordinance of Ohio. The whole of this valuable information—the most complete of its kind—was reprinted in pamphlet form and widely distributed, in response to requests from other cities here and abroad. The Board of Managers, in its turn, appointed a special committee to study the resolutions. After two months' consideration these were favorably reported back to the institute, together with an additional resolution suggesting the possibility of diminishing the discharge of smoke from locomotives within city limits by more careful firing, and more especially by the substitution of anthracite or coke for use in drilling engines. The resolutions as amended by the Board of Managers were presented to the Institute at its September meeting and unanimously adopted. The Institute—whose members are for the most part manufacturers, and therefore large consumers of bituminous coal in boilers and furnaces, and consequently smoke offenders—acting in a broad spirit of progress, placed itself on record as an opponent of the smoke nuisance, and expressed its belief in the practicability of its ultimate suppression.

A creditable feature of the discussion, says the *Record*, was the absence of any allusion whatever to special devices; the subject was confined strictly to principles equally applicable everywhere. Several months after the dissemination of the information contained in the published report, in response to a very general request from all parts of the country, invitations were sent out to the makers of improved smokeless furnaces, of automatic or mechanical stokers and of all similar devices, to appear before the Institute and exhibit models or photographs and give descriptions of their appliances. This invitation was generally accepted, and it was necessary to devote two meetings this fall to this special branch of the subject. The next issue of the "Journal" will be practically given up to brief descriptions, with illustrations, of these devices and the discussions thereon.

There was one feature of great financial importance which was thought to be outside of the proper purview of the Institute, and which was, therefore, excluded, not overlooked. We refer to the serious depreciation in value of real estate in the immediate neighborhood of the tracks of the railroads entering the city, due to the great increase in the smoke nuisance in recent years. We have knowledge that mortgages have been called in on rows of comparatively modern houses solely on this account. The selling value of the properties has been sadly diminished, and difficulty of renting has been increased by the growth of the smoke nuisance. The resolutions passed by the Institute carefully differentiated the conditions existing between stationary boilers and locomotives. In the one case they declare positively against the discharge of smoke; in the other they merely suggest a practicable method of alleviation without entailing undue expense or restrictions upon the railroads. The Institute has faithfully performed its arduous work, and it is to be hoped that the lamented death of the president of the Board of Health, who inaugurated the movement, will not put a quietus upon further proceedings. It is the plain duty of councils, in the light of the information furnished by the Franklin Institute, to pass an ordinance framed in accordance with the best features of existing smoke ordinances, avoiding their mistakes.

The plant of the Vienna Enamel & Stamping Works, Porter, Ind., has been sold by W. J. Jefferson of Chicago, for $35,000, to Frank H. Ross of that city. The works will soon be started up again.

The establishment of a Department of Commerce and Industry is strongly urged in a letter sent to President McKinley by the National Business League, of which Ferdinand W. Peck of Chicago is the president. The function of the suggested new Department would be to gather information with a view to the systematic extension of commerce with the South and Central American States and other foreign countries, collecting and tabulating statistics regarding various industries and making reports and recommendations as a basis for intelligent action in the interest of such industries and their employees.

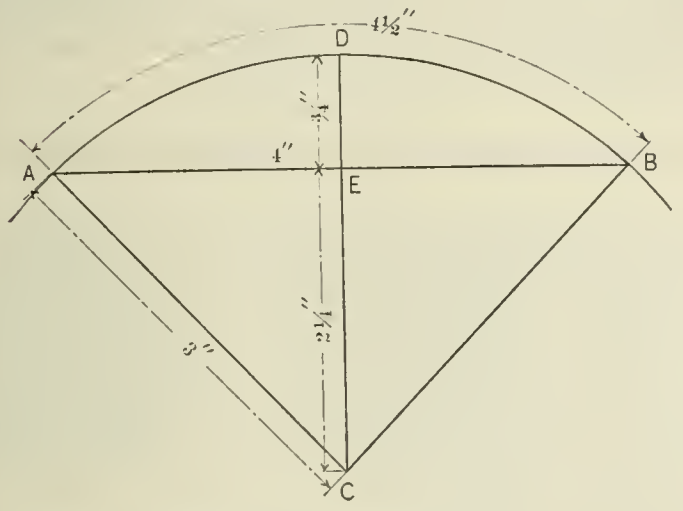
The Engineering Bureau of the United States Navy has been making some inquiries as to the possibility of procuring large merchant vessels, in an emergency, to serve as machine shops for the fleets. A list of some suitable vessels has been secured and Engineer-in-Chief George W. Melville in his annual report asks for an estimate of $25,000 for machine tools to be laid aside for fitting out one of these vessels if required.

THE LETTER BOX.

Area of a Segment.

From R. E. R., Au Sable, Mich.—Please inform me through *The Metal Worker* what the rule is for finding the area of the segment of a circle.

Answer.—To illustrate more clearly the answer to our correspondent's inquiry we have made a sketch of a part of a circle, showing a sector and segment. In the accompanying sketch our correspondent wishes to know the area of the portion A D B E. The rule given is to find, first, the area of the sector A D B C, and subtract from that the area of the triangle A B C. The area of the sector A D B C is equal to the length of the arc A D B times one-half the radius A C, while the area of the triagle A B C is equal to the length times the chord A B times one-half the distance C E. Assuming that the radius of the sector is 3 inches, the arc 4½ inches, the chord 4 inches, and the distance C E and E D 2¼ and ¾ inches respectively, we



Area of a Segment.

find the area of A D B E by the above rule to be 2¼ square inches. In engineering work the areas of segments are ordinarily determined by the use of tables. We did not refer to them, however, as we understood that our correspondent wished a rule for the purpose.

Coal Tar on Roof.

From T. H. S., Madison, Maine.—I wish to know whether or not it would be advisable to paint an iron roof with coal tar. The building is near an acid tower of a pulp mill and is rusting badly.

Note.—The question of using coal tar on metal roofs has been discussed in the columns of *The Metal Worker* at intervals for many years past. It is difficult to tell what the general opinion is, because it is so much divided. There are readers who state that coal tar is destructive to a roof, while among our correspondents during the past 10 or 15 years a number have borne testimony to the preserving quality of tar. As we said in *The Metal Worker* some time ago in answer to a correspondent, a sufficient number of layers of tar or any other water proof material will make a rain proof roof of itself and obviate the need of any other impervious coating. In 1891 a correspondent, writing on the subject of tar paint for roofs, said that he had been informed that a good paint could be made by mixing a barrel of tar with a bushel of fresh slaked lime, boiled together and applied hot to the roof. The claim made was that the lime neutralizes the acid in the tar and also prevents it from running in hot weather. In this connection it may be of interest to refer to a series of paint tests made for the Great Northern Railroad by Dr Conradson, and published in the "Journal of the Association of Engineering Societies." The following passage, which is quoted from the report, refers to conditions such as our correspondent has to cope with: "There are certain parts of steel or iron bridges, viaducts or tunnels that should have an additional (third) coat of paint. These include such places or parts of structures as are directly exposed to the steam fumes and gases from passing engines. For such a coat some cheaper asphalt paints, applied very thoroughly over the coats above recommended, would be all sufficient. Such a coat would protect the underlying primary coats for many years, preserving their natural toughness and elasticity and preventing atmospheric action on the structure." The asphalt paints referred to are made by dissolving asphalt in benzine.

Sheet Metal Supplies for the Klondike.

In *The Metal Worker* of October 23, under this heading, we printed a letter from "C. N.," Philadelphia, Pa., and gave some information upon possibilities of the trade in Seattle. We will be glad to have "C. N." send us his street address so that we may forward a letter awaiting him at this office.

Drain and Service in the Same Trench.

From W. M. M., Au Sable Chasm, N. Y.—In relaying a 2-inch water pipe which snpplies the dwelling of a customer we proposed to lay a tile sewer drain for a distance of 400 feet by the side of the iron water pipe. The two are in the same trench, although there may be a few inches between them. The objection is raised, however, that the sewer pipe should not be in close proximity to the water pipe on sanitary grounds. A great part of the time the water pipe is empty.

Note.—We hope our readers will give their opinions and describe their experiences on this subject. As a matter of sanitary precaution no sewer pipe should occupy the same trench as a water service pipe, as accidents and the ravages of time are liable to bring about conditions entirely different from what might be expected and make such an arrangement insanitary. In this instance it is stated that the service pipe will be empty for a great part of the time. Should this pipe after a long continued service become more or less porous, so as to leak, there would be a strong tendency to draw in such matter as might surround it on occasions when it is empty. The emptying process would have a tendency to create a vacuum, and if the pipe then was surrounded with the moist matter from a leaky drain the service pipe would naturally become impregnated with it. If the sewer pipe were buried at a considerable distance below the service pipe the condition would be somewhat better, but on general principles we think that all will agree that it is better to use separate trenches for the different pipes.

Iron Roof Sweats.

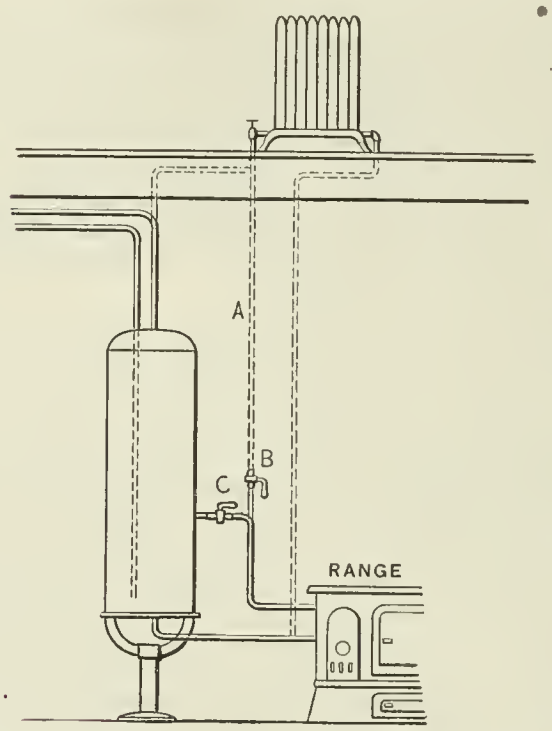
From F. B., Fremont, Neb.—I have been referred to *The Metal Worker* for information to prevent the sweating of a steel roof over a steam laundry building which is 32 x 80 feet in size. The roof is one quarter pitch, laid standing seam on sheeting like that which is used for shingling. The shingling is made of 8-inch common ship lap material, which is now seasoned so as to readily permit the warm air to pass through, and this in all probability causes the iron to sweat. I was told that an article had appeared in *The Metal Worker* during the past year

which gave a remedy for this trouble that was cheap and easily applied.

Note.—In previous issues of *The Metal Worker* it has been stated that the sweating of a roof is caused by the moisture in the atmosphere condensing on the under side of the metal, and when the quantity of condensation was sufficient it would run through any convenient opening in the ceiling. When the cause of the difficulty is so clearly known the remedy should be readily discovered. A correspondent has reported that in one instance in his experience such a difficulty was overcome by making a sufficient number of openings in the roof at different points and connecting them with small ventilators. This enabled the moist atmosphere to pass off before condensation took place. In other instances it has been necessary to finish the ceiling with lath and plaster in order to prevent the atmosphere from penetrating into the space between the ceiling and the roof. It has also been stated by some of our experienced contributors that there are some classes of buildings on which a tin or metal roof should never be put, and it can readily be seen that the moisture coming from the laundry would make some other character of roof desirable for such a building, unless every precaution is taken to prevent the moisture coming in contact with the cold surface of the metal. We shall be glad to have our readers contribute anything that has arisen in their experience which would be of benefit to this correspondent.

Heating a Radiator From a Kitchen Boiler.

From F. B., Harrison, N. J.—I should be glad to recieve a little information as to how to proceed to heat a room over a kitchen with hot water taken from a kitchen boiler, and would like to know if it can be done so as to heat satisfactorily. The room is 20 x 20 and the sketch presented herewith shows the location of the range, boiler and radiator.



Heating a Radiator from a Kitchen Boiler.

Answer.—The successful heating of the room depends on the capacity of the stove and the water back which is used for heating water. If the water in the boiler now in use gets excessively hot, so that it is sometimes noisy, it is probable that the water back has a sufficient capacity for the extra work that will be required. Without any other information as to the capacity of the room to retain heat than is expressed in its size, we would assume that 1 square foot of heating surface should be provided for every 30 cubic feet of space, and as the room is above the kitchen we assume that the ceiling is not over 8½ feet high. Consequently, the radiator to heat the room should present not less than 113 square feet of surface. It is considered ordinarily that a 1-inch pipe is hardly large enough to supply a radiator of this size, but in view of the location of the room over a warm kitchen and the short run to reach the radiator the pipe may be large enough in this case. Assuming that the kitchen boiler is not piped with much smaller than ⅝-inch pipes, we would suggest that the fitting be taken out of the top of the boiler and a 1-inch iron pipe be connected directly into it and run direct to the radiator, with a tee located at a point where the hot service pipe to the fixtures in the building can be readily connected. A valve should be placed on this pipe where it connects with the radiator. The return from the radiator should be run to the lower opening in the boiler, 1 inch in size throughout, and a tee should be placed so as to receive the pipe which brings the cold water to the water back from the boiler. If the water back does not have sufficient capacity to heat both the boiler and the radiator, the pipe A may be run from the side connection of the boiler direct to the radiator and the pipe leading from the hot service pipe at the boiler to the radiator may be left out. This pipe might, however, be retained for use when hot water was desired from the boiler and also heat in the radiator. If the pipe A is run a valve should be placed on it at B and another valve also placed at C. This would enable the circulation of water to be controlled at will. By closing the valve B the circulation would be through the boiler; by opening this valve and closing the valve C the circulation would be direct through the radiator. There should be an air valve placed on the radiator. In this instance there would be no need of an expansion tank, inasmuch as the return pipe from the boiler and the radiator permits of the expansion of the water on heating to act against the pressure of the water in the service pipe.

Sheet Aluminum Cheaper than Sheet Brass.

An interesting recent development in the metal trades is the fact that sheet aluminum is now being sold at lower prices, relatively, than sheet brass, as a comparison will show. The base price of the price-list of ordinary brass sheet is 22 cents per pound, and the maximum discount to ordinary customers is 45 per cent., making the net price for brass sheet 12.10 cents per pound. It is a fact that there is a further discount in special cases of 5 per cent., and also ½ per cent. for cash in ten days. This would mean, at the lowest rate, 5 per cent. off from the 12.10 cents, or 11.495 cents per pound ; and where a cash discount is availed of a further ½ per cent., or a rate of 11.338 cents per pound.

Now, the Pittsburgh Reduction Company have published discounts of 10 and 5 per cent. for large quantities of strip rolled aluminum sheets—that is, 10 per cent. from the 38 cents per pound—which would give 34.2 cents per pound, and 5 per cent. further would give 32.49 cents per pound. The aluminum price is therefore 32.49 cents per pound in the lowest rates in ordinary large transactions, as compared with 11.338 cents per pound for the price of brass sheet.

The specific gravity of cast brass is 8.32, and 8.549 for wrought brass ; and the factor which must be introduced to allow for the fact that the cast brass is heavier than aluminum is 3.25, and wrought brass 3.19 times heavier than the aluminum. So, by multiplying the lowest selling price for sheet brass of 11.338 cents by 3.19, one would have 36.169 cents per pound as the equivalent price for aluminum sheet ; whereas the lowest selling price, with discounts off as shown in the price-list of the Pittsburgh Reduction Company for November, 1897, is 32.49 cents per pound. From this it is evident that the selling price freely offered in the November printed price lists of the Pittsburgh Reduction Company is at least 10 per cent. cheaper for aluminum sheet than the lowest selling price for similar sheet brass by any of the Association of American Brass Manufacturers.

It is not to be understood, however, that an ordinary consumer of brass is able to obtain the maximum discounts allowed. It can be safely figured that most purchasers of brass are paying a rate of 12½ to 13 cents per pound ; and multiplying 12½ by 3.19 (the factor to allow for the greater specific gravity of brass) will give 39.875 cents per pound as the comparative selling price for aluminum ; and multiplying 13 cents by 3.19 would give 41.47 cents per pound as the comparative selling price for aluminum.

The rates given by the Pittsburgh Reduction Company according to their price-list for parties ordering considerable quantities of aluminum, at least four tons per month, to replace brass, would be therefore at least 10 per cent. cheaper for aluminum than brass, and in many cases considerably cheaper still, relatively.

SHEET METAL WORK.

SLATE AND COPPER ROOFING ON FIRE PROOF BUILDINGS.—III.

BY WILLIAM NEUBECKER.

OBTAINING WATER TIGHT JOINTS BETWEEN COPPER AND TERRA COTTA.

Fig. 14 shows the method of joining metal to terra cotta in a water proof manner. A shows the terra cotta, B the brick work and C the groove which is modeled into the clay before hardening. E is the porous terra cotta blocks, and F the concrete, which is laid to the required pitch by the mason. H H H represents the copper gutter lining, with an edge, J, bent into the groove C, and then filled with molten lead, as before explained. Care should be taken when calking the lead to give light blows with the hammer, as the terra cotta is brittle and has a tendency to split.

In Fig. 15 are shown two methods of joining metal to terra cotta without the use of a groove. The first is shown at A, where C is the dovetail attached to A, and over the dovetail C the metal B is sprung. The second method is shown at A¹, where C¹ shows a beaded terra cotta drip, the metal being fastened by means of the metal B¹ clasping around the drip C¹.

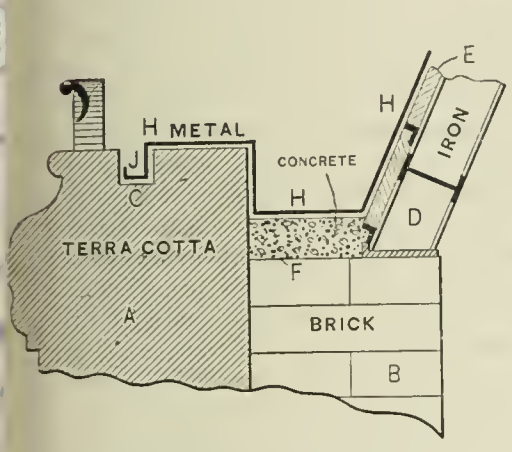


Fig. 14.—Sectional View, Showing Groove in Terra Cotta for Making Joint.

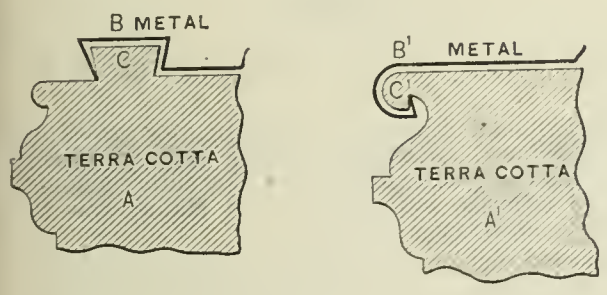


Fig. 15.—Two Other Methods of Making Joints with Terra Cotta

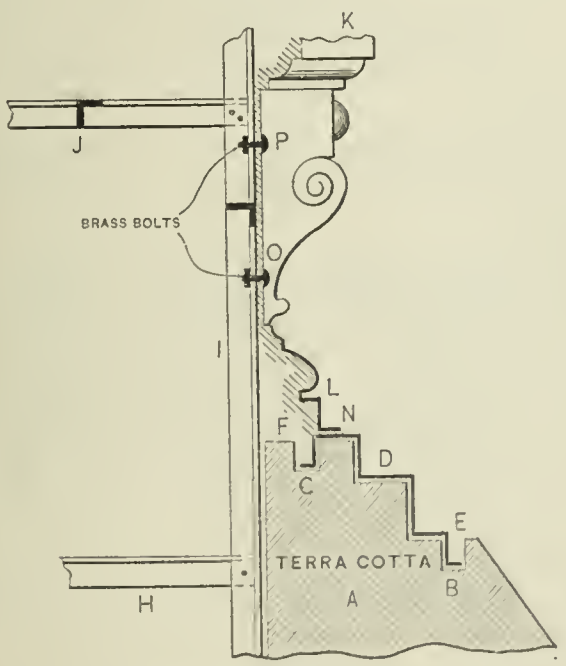


Fig. 16.—Showing Joint Between Metal and Terra Cotta in Tower or Other Work.

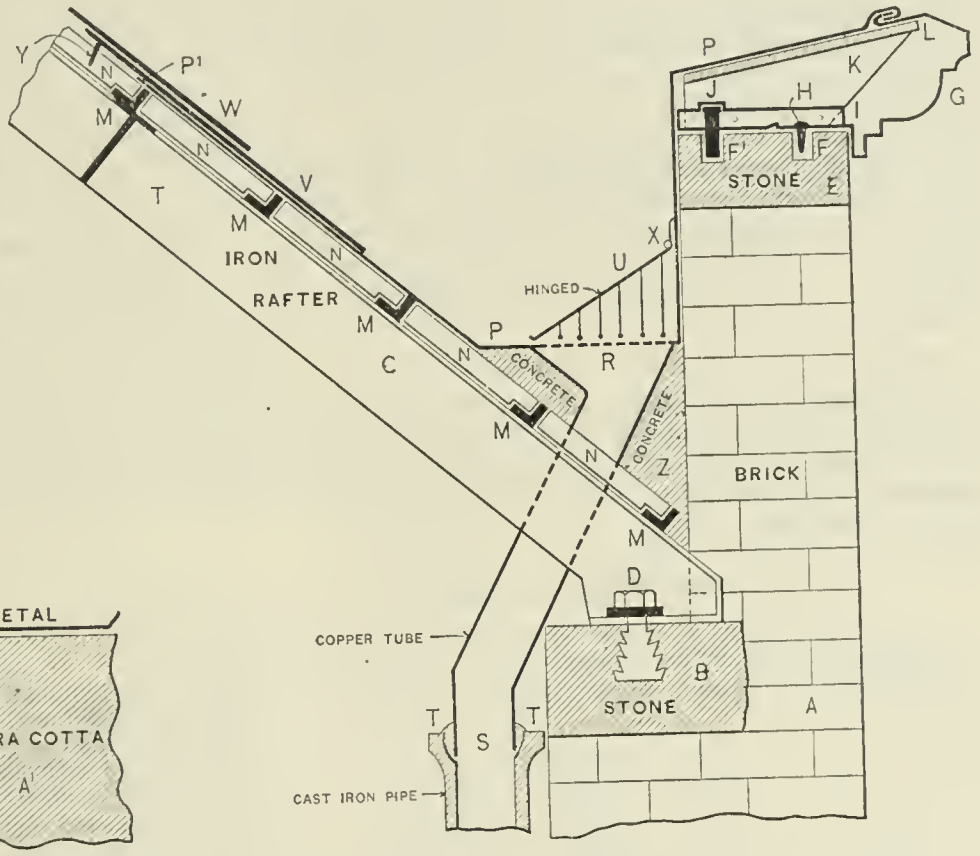


Fig. 17.—Showing Method of Setting Molding on Parapet Wall, Lining Valley and Connecting Tube Inside of Building.

SECURING BASE FLASHINGS FOR MOLDINGS.

It is sometimes the case that a metal cornice or molding is to surmount a terra cotta base, as in Fig. 16, under which a base flashing must first be flashed. This is accomplished as follows:

Assuming that the terra cotta has a profile as at A, let B and C be the grooves which have been previously modeled in the clay before hardening. The copper flashing is then formed to correspond to the profile of the terra cotta, having flanges bent outward at E and F, which are placed in the grooves and calked with molten lead. The flashing having been put on in this maner, the cornice shown by K L is then set, having an outward flange, which is soldered all around the base at N, and bolted to the iron framing H I J with brass bolts P and O at the top.

SETTING MOLDING ON PARAPET WALL, AND LINING TOP AND VALLEY WITH COPPER.

On some buildings, instead of using stone to cap the parapet walls, copper is employed, which protects the lower wall and prevents the rain from soaking through it.

Fig. 17 shows the method of doing this kind of work. E shows the section of the stone trimmings over which the molding is set, F and F¹ being the holes in the stone,

drilled every 2 feet and plugged as before described. The molding G is now set, the flange I of the molding extending far enough to allow it to be nailed into the hole F. The molding being fastened in this manner, wooden brackets K are fastened into the plugged hole F^1, after which the planking L is laid over the brackets. After the angles are filled with porous terra cotta blocks N, N, &c., by the mason the concrete Z is laid to carry the water to the various outlets, care being taken to have the mason trowel the concrete even and smooth, so that after the copper lining is laid and walked over the copper will still be even and smooth. The carpenter and mason having finished their part of the work, the lining P^1 P P is laid as shown, locking the same and soldering to the molding G at the top, and allowing the lining to extend up as high as P^1, which would prevent the drifting snow when thawing from soaking under the slates and over the lining. R is the mouth piece connected with the lining at the top, and reduced at the bottom S to allow connection to be made with the cast iron pipe on the inside of the building and calked at T T.

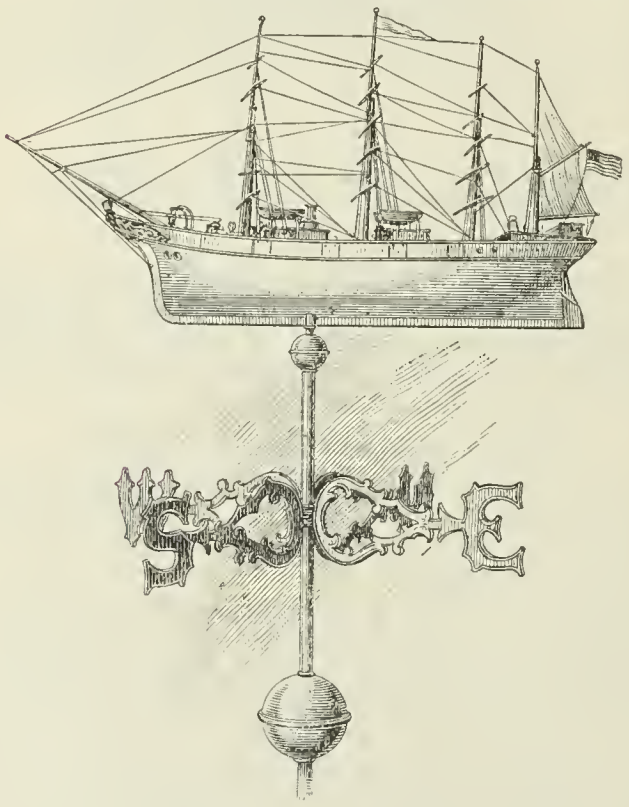
Before calking the copper tube to the iron pipe a brass ferrule should always first be soldered to the copper tube at the bottom and then inserted into the cast iron pipe. U shows a hinged strainer with the hinge at X, which allows it to be opened for cleaning purposes. V and W are the slates and Y the hard brass nails driven into the terra cotta.

FASTENING SNOW GUARDS TO POROUS TERRA COTTA.

When putting snow guards, of whatever make, upon buildings having porous terra cotta blocks it is wise to use those made of copper or brass, as the terra cotta has a tendency to absorb the moisture and would eventually rust any guard made of iron.

A Handsome Weather Vane.

The taste of a property owner is very often reflected in the weather vane which he displays on his building. In the accompanying illustration we show a vane made by



A Handsome Weather Vane.

Thomas W. Jones, 170 Front street, New York City, for Capt. J. G. Baker of the four-mast steel ship "Kenilworth," which he intends to use on his barn at West Harwich, Mass. It is a miniature of the "Kenilworth," which is a vessel 380 feet long. The vane is made entirely of copper and formed on the lines of the ship. The hull is 4 feet long and is provided with copper masts, and the rigging is also of that metal. On the prow is a figurehead representing Queen Elizabeth. The spars and the arrangement of the rigging are as near as possible that of the ship, having been arranged from the plan furnished to the riggers when the ship was rebuilt at San Francisco after having been wrecked on the California coast. Mr. Jones was called upon to furnish this vane owing to the reputation which he has already secured in the seafaring world for his eagles and gilded balls for flagstaffs. The ship is so built as to be perfectly balanced on the iron spire which supports it, and moves so easily that a very slight wind will change its position.

Western Roofing Supply Trade.

The Chicago roofing supply houses report their trade running unusually late this season. The remarkably mild and exceptionally dry weather is of course mainly responsible for this condition. New work and repairs are undertaken which in other years would have had to be deferred until spring. The scarcity of black sheets has caused some stiffening in the price of large lots of steel roofing and corrugated and stamped siding. Very low contracts placed early in the summer for material have not always proved so advantageous to buyers as they anticipated. The advance in sheets was quite marked, so much so that later business is suspected to have been too tempting to the mills and they starve their cheap customers with meager shipments, while straining every wheel to accommodate the new buyer at a better price. They can hardly be blamed for doing a moderate share of this sort of work, but it should not be carried too far. Part of the present scarcity is also to be attributed to the difficulty experienced in securing regular shipments of sheet bars from the steel works. They oversold their capacity almost without exception when trade revived, and those who handle finished products are the ultimate sufferers.

FLASHINGS.

The warehouse of the Boston Roofing Company, 116 Water street, Boston, Mass., was damaged by fire on October 27.

The Carbon Slate Company, Slatington, Pa., have just filled an order for 77 carloads of Roofing Slate for export. The order was for 4700 squares, and the entire amount, except seven carloads, which came from Maine, was the product of the Slatington quarries.

It is reported that the Caldwell & Peterson Mfg. Company, manufacturers of Sheet Metal Roofing, Wheeling, W. Va., will erect a new factory building of structural iron.

A new use for aluminum has been introduced lately by August Sohlmann, a manufacturer of Leipsic, Germany. It consists of a so called tapestry, or wall covering, formed of thin aluminum sheets, stamped with various patterns. For fastening to the wall the sheets are provided with wooden strips, or else they are backed entirely by wood, to which the tapestry is fixed by means of aluminum nails.

It is reported that the plant of the Columbia Iron & Steel Company, Uniontown, Pa., will be leased by Pittsburgh and McKeesport capitalists, for the manufacture of Sheet Iron.

The Miner & Peck Mfg. Company have taken the old Yale Iron Works Building at the corner of Chapel and Wallace streets, New Haven, Conn., where they have established their factory for manufacturing drop presses.

Articles of incorporation have been filed in the Camden County Clerk's office by the Metallic Mfg. Company, Camden, N. J. The objects of the corporation are to manufacture and sell all kinds of Metallic Cornices, &c. The capital stock of the company is $50,000, and the amount paid in is $1000. The corporators are James A. Hargan, Charles A. Damon and Edwin L. Seabrook, all of Camden.

The success of the cornice class of the New York Trade School, 1260 First avenue, New York City, is very clearly demonstrated by the fact that the applications this year have been greater than the accommodations could take care of. Altogether 32 persons applied, but only 21 could be accommodated. The management, however, we understand, intend to enlarge the space next year and put up 40 benches, drawing boards, &c. The demand for instruction in sheet metal work and pattern cutting, as we know from letters received from all over the country, is very considerable, and if the New York Trade School builds up an important department in this line their work will benefit untold numbers of young men who are ambitious to thoroughly master the cornice trade and familiarize themselves with the somewhat difficult art of pattern cutting.

HEATING AND PLUMBING.

SEWER VENTILATION.*

BY J. W. HUGHES OF MONTREAL

It has for some time been accepted as an imperative requirement of a properly planned plumbing system that provision be made for a free circulation of fresh air at all times through not only the main internal sewers of a building, but also through the smaller branches known as the waste pipe; in other words, that there be no dead ends, but that each and every part of a properly planned system of sewers for a building be constantly swept by a current of air; and carrying out this principle, provisions are made in the planning of up to date public sewer systems for the ventilation of the same The private sewers and waste pipes of a building, forming as they do but a part of the general system, should in my opinion be treated as a part of the whole; and the attempt to cut them off, as is done by fitting what is known as the intercepting trap, is a mistake: First, because it interferes with the basic principle of the water carriage system for the disposal of sewage, which is that the sewage should in the most rapid manner possible and without obstruction be carried from its source to its destination, yet the advocates of the intercepting trap place an obstruction (in other words a miniature cesspool) just at the point where it will do the greatest possible injury, and obstruct the rapid carrying away of the sewage, and defeat at the start the main principle on which the system is based—namely, the rapid removal of sewage and its carriage by an ample supply of water to its destination.

THE INTERCEPTING TRAP.

The advocates of the intercepting trap claim that the improved forms of this cesspool offer very little obstruction to the flow. Such a contention is absurd, as if they did not obstruct the flow, catch and hold the sewage they would not be traps. Again, it is claimed that the improved traps are continually washed out or scoured to a certain extent. This is true as compared with the older forms; but let any one who has had occasion to open the cleaning eye of one of these traps that has been for some time in use speak of the conditions found and he must tell of stored up putridity, sickening odors and a condition of things unsanitary, not to be found even in the main sewers of the streets, and certainly not to be found in any other portion of the pipes in a building where the sewage has had an unobstructed flow.

PREVENTS AIR CIRCULATION.

My second charge is that it completely defeats any effectual general system of sewer ventilation by preventing free circulation of air through the whole system of main sewers and that part of them consisting of the building sewers. To offset this in part what is known as the fresh air inlet is placed between the intercepting trap and the building. This is a pipe brought to the surface and fitted with a suitable terminal; the proper name of this pipe is a "stink outlet," as when a fixture is used the rush of water from it must force a portion of the air out of the inlet, and then it of necessity becomes a stink outlet, and as a rule in cities this pipe must be so placed as to make it a dangerous nuisance even to the wayfarer, or if at a distance from the foot walk to the inmates of the building with which it is connected, as the foul air escaping from it gains access to the building it is proposed to protect through doors and windows. "But," says the advocate of the intercepting trap," would you advise arranging pipes so that the air of the street sewers would have free passage through the pipes in a building?" To this my reply is "Yes" And there is no other safe plan. People who live in populous districts must bear each and every one his part of the risks as well as sharing the benefits of the whole. No one living under conditions imposed by the concentration of large masses of people on a limited area can escape, and the principle of the greatest good to the greatest number must apply.

INEFFECTIVE SEWER VENTILATION.

The advocates of the intercepting trap do not deny the necessity of sewer ventilation, but they attempt to provide for it in detail instead of as a whole, and so defeat the object they wish to attain. They will tell you that the street sewers must be ventilated by having perforated manhole covers placed at regular intervals along the line of street sewers—that is, cut off the house from the street sewers by means of a trap, but let the main sewers have free and open connection with the street. Now, as the streets of a town are the sources from which buildings derive their greatest supply of fresh air, my claim is that such a course is wrong and insanitary. Given pure air in the streets and there must be pure air in the buildings, the local cause of air pollution being, of course, excepted. Do away with the trap on the private sewers, continue the interior sewers of the building full size through the roof, carrying them to a sufficient hight to be well above adjacent windows; then there will be a natural circulation of air through the entire system of both public and private sewers, and the outlet from the sewers, which is acknowledged to be a necessity, will be above the general line of the house tops and not at the street level, as is the case when the intercepting trap is adopted. The higher temperature of the pipes passing through the building, especially in the cold season, will insure this circulation at the time when it is most required. Of course there are exceptions to all rules, and there are no doubt in all cities certain places where the local conditions would call for the placing of a trap in the private sewer; such cases call for the exercise of the skill and experience of the practical plumber and sanitary engineer. It is no more possible to lay down a rule covering every possible contingency called for in scientific plumbing and ventilating than it is to apply fixed rules to the practice of medicine. If it were there would be little need of skilled and experienced physicians. The principles of scientific medicine and plumbing are fixed, but the application of these principles calls for the intelligence acquired by education and developed practice.

CODE OF PLUMBING PRINCIPLES.

Much injury has been done by attempting to frame plumbing by-laws that will apply to every case. The conditions vary in almost every building, and to adapt the principles to the special requirements requires not only practical but scientific knowledge. If the American Public Health Association would make a study of the general principles covering this question and embody them in a code having its indorsement, leaving the practical application of these principles to those whose special duty it is to apply them, much good would result. In conclusion, conditions exist in northern climates during that portion of the year when snow is on the ground that completely neutralize the effect of the perforated manhole covers over the street sewers, and during such time, in cities where the intercepting trap is in general use, the main sewers are without ventilation and a serious condition of affairs exists, as the buildings being heated to a greater degree than the outer air have a cupping action and draw the air from the sewers into them, beneath the frozen and almost impervious top soil and paved roadways. Where the soil is porous this is sure to occur, even when the buildings are situated a considerable distance away from the main sewers.

Sewers breathe! Under certain conditions the air would rush into them; again it is being expelled, with considerable force. Atmospheric conditions partly account for this, but the varying quantities of solid and liquid matter constantly entering and leaving them have an important bearing on the question. Such being the case, proper breathing places must be provided, and any attempt to bottle up the sewer air will end in failure. What place so suitable as above the roofs of buildings, where the winds will disperse the foul gases and the light and air disinfect them?

* Read before the American Public Health Association at Philadelphia, October 28, 1897.

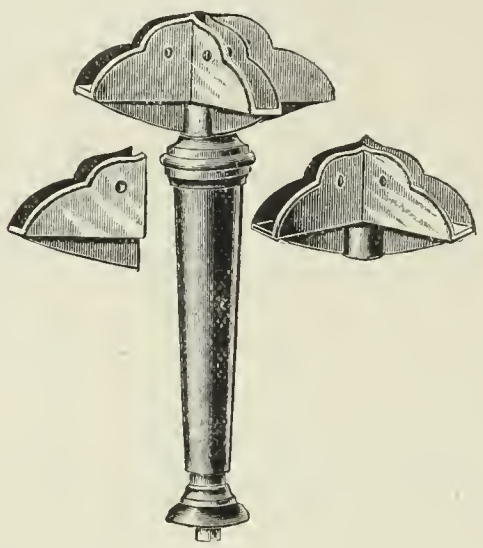
Some Sanitas Specialties.

The Sanitas Mfg. Company, 48-54 Union street, Boston, Mass., are very much pleased with the reception accorded the Sanitas Regal closet, an apparatus which was illustrated in *The Metal Worker* last August. A special feature, it will be remembered, is the metal outlet which connects the closet under water, so as to meet the requirements of Boards of Health who demand a water test below the water level in the closets. The connection is simple and the earthenware can be removed without disturbing the metal leg. These closets, which are particularly recommended for fire proof buildings, are adapted either to a floor waste or wall waste. The Sanitas Simplicity urinal is another of the specialties made by the Sanitas

Mfg. Company which is having an excellent reception from the trade. It is made on the same principle as the Sanitas closets, having a large body of water in the bowl and a retarding chamber which insures the refilling of the bowl after being flushed. The flushing is done either automatically or with a pull and chain. The Sanitas closets and urinal are two of several specialties illustrated in a circular issued by the Sanitas Mfg. Company, and which the trade will find interesting reading and valuable for reference when called upon to do first-class plumbing work. These and other circulars will be sent on application to the company.

Toilet Room Fittings.

A complete line of toilet room fittings for plumbers is manufactured by J. J. Ryan & Co., 68 to 74 West Monroe street, Chicago. They have just brought out a new line



Toilet Room Fittings.—Fig 1.—A Closet Leg.

made of a special aluminum alloy. This alloy is claimed to be the very strongest in use, polishes a beautiful silver white, requires very little cleaning and will hold its color

Fig. 2.—A Door Pull.

permanently. Although its first cost is a little higher than nickel plated polished brass, the subsequent saving of labor in cleaning more than overcomes that difference.

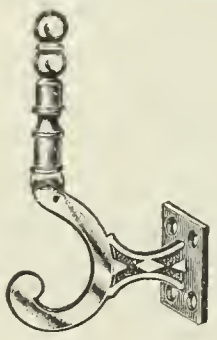


Fig. 3.—A Hat and Coat Hook.

Specimens of the hardware are herewith illustrated. Fig. 1 is a closet leg, Fig. 2 a door pull, Fig. 3 a coat and hat hook and Fig. 4 a specimen of railing.

Request for Catalogues.

E. Jackson & Son, Windsor, N. S., tinsmiths, plumbers, heaters and ventilators, having lost all catalogues in the late fire at Windsor, desire us to ask all dealers in lines which they cover to send them their respective catalogues with latest discounts, &c. The firm make a specialty of hot air heating.

The management of the recently completed Lachine Rapids plant, on the St. Lawrence, announces its intention of entering the field of domestic heating in competition with anthracite coal at $6 per ton, which is the price which obtains in that district. The comparatively high coal rate, combined with the low cost of the electric power, as developed by this water-power plant, will permit of its adoption, for cooking purposes at least, on the score of

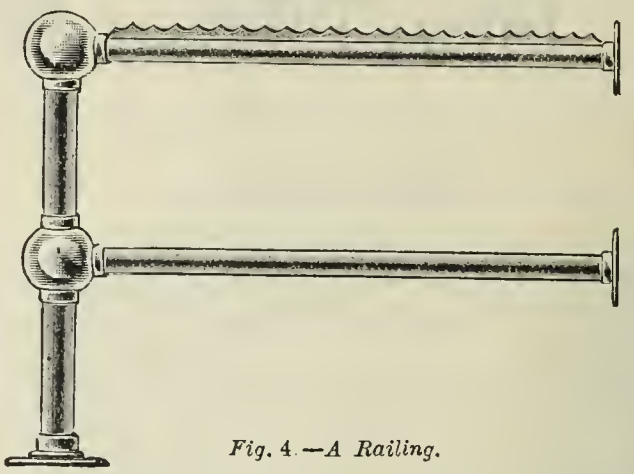


Fig. 4.—A Railing.

economy, with all its acknowledged advantages as an additional inducement. About 25,000 horse-power has been obtained in this plant at a cost of nearly $2,000,000.

Acetylene Gas Rules.

The Kentucky and Tennessee Board of Insurance Underwriters, through its executive committee, has authorized the use of acetylene gas and machines, according to the following rules :

1. No generator shall be located in any building where insurance policies cover that can generate gas under a greater pressure than that sufficient to distribute it through the pipes of the building, or under a greater pressure than that used with ordinary city gas.
2. Each generator must be properly designed and have sufficient capacity for the work it has to do, and must be made in such a manner and of such materials as to insure durability and stability.
3. Each burner burning 1 cubic foot of gas per hour shall have at least 1 pound of carbide for its supply in the generator when first loaded, to prevent too rapid generation of gas.
4. No generator shall be installed the maximum capacity of which is less than one pound of carbide for each 1-foot burner.
5. Each generator must be so constructed that when the lights are extinguished the supply of water to the carbide, or the supply of carbide to the water, will cease automatically.
6. Each generator must be provided with a connection leading outdoors, which, in the event of an accidental overproduction of gas, will convey such surplus to the outside air.
7. The room in which the generator is placed shall be well ventilated, so that any escaping gas may not be confined in said room.

Permission is hereby granted for the use of acetylene gas on the premises described in this policy, providing the apparatus for same be installed according to the rules of the Kentucky and Tennessee Board of Underwriters, and by parties duly authorized by said association for the purpose of installing apparatus for generating acetylene gas.

Permission is also granted to keep on the premises, outside the building in which this policy covers, in air tight packages, not to exceed 150 pounds of calcium carbide.

It is especially warranted by the assured: First, that no change shall be made in the arrangement of the apparatus without the written consent of this company indorsed on this policy. Second, that the genreator shall not be charged. or calcium carbide handled, except by daylight only. Third, that no artificial light shall be permitted in the room where such calcium carbide is stored ; and, fourth, that no calcium carbide, except that contained in the genreator, shall be kept in the building where this policy covers.

The use of liquid acetylene, or of gas generated from liquid acetylene, is absolutely prohibited.

The Dalton-Ingersoll Company, 169-175 High street, Boston, Mass., are New England agents for the Thompson S. P. Smoke Testing Apparatus made by the Gunster & Forsyth Mfg. Company, and report an excellent demand for these machines in the territory they control. They have already sold a large number which have given most satisfactory results in testing plumbing systems. The machine is about to be tried by the Boston Department of Building and it is expected that their approval will lead to a still further increase in the demand for their apparatus.

Nominations for Officers of Engineers' Society.

The Nominating Committee of the American Society of Heating and Ventilating Engineers have made the following nominations for officers to be elected at the annual election to be held during the meeting January 25-27, 1898, at 12 West Thirty-first street, New York :

President.

Wiltsie F. Wolfe, Boston, Mass.
D. M. Quay, Chicago and New York.

First Vice-President.

J. H. Kinealy, St. Louis, Mo.
Harrie D. Crane, Cincinnati, Ohio.

Second Vice-President.

A. E. Kenrick, Brookline, Mass.
A. A. Carey, New York.

Third Vice-President.

John A. Fish, Boston, Mass.
J. J. Blackmore, New York.

Secretary.

Stewart A. Jellett, Philadelphia and New York.
B. Harold Carpenter, Wilkes-Barre, Pa.

Treasurer.

Judson A. Goodrich, New York.
Leroy B. Sherman, New York.

Board of Managers.

(Five to be elected.)

W. M. Mackay, New York.
Francis A. Williams, New York.
Thomas Barwick, New York.
John A. Connolly, New York.
J. R. Wendover, New York.
Newell P. Andrus, New York.
George B. Cobb, New York.
Wm. H. Clark, Lebanon, Pa.
J. A. Lansing, Pittsburgh, Pa.
Abram C. Mott, Philadelphia, Pa.

Council.

(Five to be elected.)

A. A. Cryer, New York.
B. F. Stangland, New York.
Wm. McMannis, New York.
W. S. Hadaway, New York.
W. H. Hill, New York.
John Gormly, Philadelphia.
R. C. Carpenter, Ithaca, N. Y.
Henry Adams, Washington, D. C.
Herman Eisert, Baltimore, Md.
John Hopson, Jr., New London, Conn.

The Council of the society at its last meeting announced that the ballots from the last mail vote had resulted in the election of the following new members :

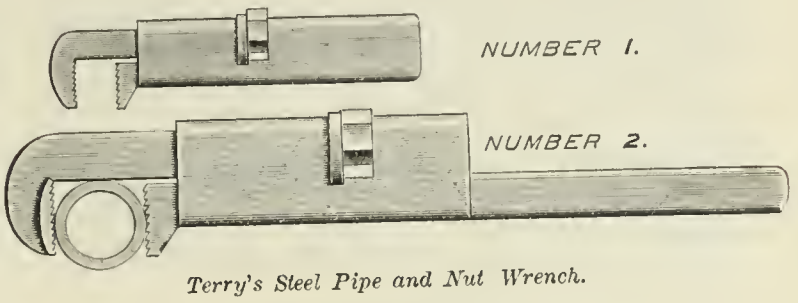
Robert Campbell, Brooklyn, N. Y.; E. T. Weymouth, Brooklyn, N. Y.; Juan A. Almiral, New York; Robert Ernest Atkinson, Leicester, England; Reginald Pelham Bolton, New York; Frank K. Chew, New York; Samuel Martin Green, Holyoke, Mass.; W. H. McKiever, New York; Sanford C. Smith, Buffalo, N. Y.; Claudius Wadsworth, Jr., New York, and Nelson Gordon Thompson, Washington, D. C., to Junior membership.

The Kelly & Jones Company.

Owing to their rapidly growing trade in foreign countries the Kelly & Jones Company have recently opened offices at 29 New Bridge street, London, E. C., England, in charge of Joseph Kelly, son of John T. Kelly, president of the firm. The Kelly & Jones Company are large manufacturers of Iron Pipe Fittings, Brass and Iron Valves, Cocks, &c., for steam, gas, water and oil. Also Iron and Steel Tubing of all kinds. Their works are located at Greensburg, Pa., and warehouses and offices are maintained at 311-315 First avenue, Pittsburgh, Pa.; 104 John street, New York, and 48-50 Clinton street, Chicago. The firm have made numerous shipments of their goods abroad, a large consignment recently going to Johannesburg, South Africa. They are meeting with a gratifying demand for their goods at home and abroad and at present are operating their plant to its full capacity. They regard the outlook for business as extremely encouraging. Their Pittsburgh house is in charge of George M. Jones, treasurer of the concern.

Terry's Steel Pipe and Nut Wrench.

The Terry Mfg. Company, Horseheads, N. Y., are offering a pipe and nut wrench, as here illustrated. The wrench is made entirely of steel with case hardened jaws. The thread is on the upper jaw, which runs through a heavy steel washer in front of nut, which makes it a swing jaw and gives it the action of a grip, to do away with any possibility of slipping on pipe or nuts. The wrenches are nickel plated. Wrench No. 1 in the cut represents the



Terry's Steel Pipe and Nut Wrench.

6-inch size, which takes ⅛ to ½ inch pipe. The 8, 12 and 18 inch sizes are of the style shown by No. 2, and take pipe from ⅛ to 3 inches.

NOTES.

The manufacturers of Steel Clad Copper Lined Bathtubs and All Steel Enameled Tubs have issued, under date of October 20, 1897, a new American standard list on these goods. Full particulars of the changes in prices will be found in our Trade Report columns.

The Brownley Mfg. Company have been incorporated in New York City to manufacture Steam Fittings and Plumbers' Supplies, with a capital stock of $50,000. The directors are William J. McQueen, Julius C. Druchlieb and John L. Thomas of New York City.

The Magee Furnace Company of Boston, Mass., are sending out a four-page circular of their Mystic Hot Water Heater. It is shown as a cast iron boiler without a casing and also with a casing of galvanized iron to prevent the cooling effect of the air striking directly on the outer surface of the water chamber. The last page presents a sectional view from which the construction may be readily understood. The boiler is made in five sizes rated to carry from 150 to 600 square feet of heating surface.

M. Carney, Philmont, N. Y., has recently secured the contract for installing a No. 303 Capitol Hot Water Heater in the residence of E. C. Wagner at Kinderhook, and for placing a No 304 Capitol in the Reformed parsonage at the same place. He is also installing a hot water system in the carriage repository of James Chesterman at Valatie, N. Y., and is to do the plumbing and setting of a No. 304 Capitol Hot Water Heater for Henry Best at Craryville.

Brown Brothers, Saginaw, Mich., bid $2700 and secured the contract for steam heating and ventilating apparatus for the public building in their city.

A difficulty between the dealers in plumbers' materials and some of the plumbers in Minneapolis, Minn., has led the Water Works Committee to consider the propriety of carrying and jobbing a line of plumbers' supplies.

L. Leidle & Co. are a new firm in the tinning and plumbing business at Fergus Falls, Minn., Mr. Leidle having had 27 years' experience at the tinners' trade.

The Anaconda Copper Mining Company have been granted a license to carry on the plumbing business at the corner of Main and Court streets, Butte, Mont.

C. F. Pfeffer of Denver, Col., bid $3011 and secured the contract for placing a steam heating system in the quarters of the commanding officer at Fort Logan.

A. V. Fetter has moved his plumbing establishment to the corner of Fifth and Jay streets, La Crosse, Wis.

The contract for furnishing heating and ventilating apparatus and an electric lighting plant for School No. 12, New York, has been awarded to the Foskett & Bishop Company of New Haven, Conn.

E. Y. Wilkes has established a plumbing shop in the basement of 210 South Broad street, Trenton, N. J.

R. M. Wilson, Rome, N. Y., is displaying at his New York salesroom, 92 Walker street, one of his newest productions in the Bathtub line. He has during the year completed a fine plant for the manufacture of Enameled

Cast Iron Bathtubs, and the sample on display speaks well for the character of the output. The plumber who is using Enameled Bathtubs is invited to examine this new line and secure prices. The sample is of the French pattern with narrow roll rim.

E. P. Johnson, secretary of the Plumbers' Union of Lexington, Ky., has opened a plumbing establishment at 180 East Main street.

Hilborn & Faulkner, Bucyrus, Ohio, are removing their plumbing establishment to North Sandusky avenue.

The north side of the new bakery block on Portland street, Morrisville, Vt., has been rented by H. J. Bonette, a plumber, gas and steam fitter and tinsmith with 30 years' experience. For the present Mr. Bonette establishes a general plumbing, jobbing and repair shop, with the expectation that in the spring, if the outlook is favorable, he will put in a general tin and hardware stock.

Kieffer Bros., Syracuse, N. Y., who make Stove Repairs a special branch of their business, have been awarded the contract for plumbing a new school building.

The Superior Mfg. Company of Cleveland, Ohio, with $25,000 capital stock, have been incorporated. The object is to manufacture jobbing brass and rubber specialties, plumbing supplies and other articles. W. E. Byrnes, M. D. Hunt, H. B. Halloch, C. C. Brackin and David B. Carpenter are the incorporators.

James W. Brown, inspector of plumbing, Brockton, Mass , has invented and is taking out patents for a new roof vent device for plumbing systems.

A plumber of Washington, D. C., has been brought before the Police Court for violating the plumbing regulations by using light cast iron soil pipe where heavy pipe should have been used.

An explosion caused by gas from the street main did a damage of $10, 00 recently at Providence, R. I., the force being sufficient to throw stones to a considerable distance. It seems difficult if not impossible to provide gas pipes which will prevent the loss of gas through them. It is a well known fact that the gas companies in estimating cost allow for a large percentage of gas to be lost through the pipes, and that whenever a street is opened there is a strong odor from the gas impregnated soil. This smell in the summer season is extremely offensive to the occupants of buildings along the street where such an opening is made.

Braman, Dow & Co., Worcester, Mass., bid $1635 and secured the contract for heating the city almshouse.

The Standard Steam Specialty Company have recently been incorporated in New York City to manufacture steam and electrical specialties, with a capital stock of $15,000. The directors are Herbert Joslin, William H. Long and Elbert Crandall of New York City.

Any one who is interested in securing an established business in plumbing, heating and light hardware, in a good location in Massachusetts, will do well to notice the Special advertisement in this issue signed "Exchange," in which is described a business paying $4000 a year that the owner wishes to sell or exchange.

A new concern, known as the Westfield Tank, Seat and Bracket Mfg. Company, have leased the C. N. Thompson piano leg factory, at Westfield, Mass., and will manufacture plumbing supplies in the wood line. Holyoke parties are backing the new concern.

Churchill & Washburn, Brockton, Mass., have just completed the plumbing and automatic sprinkler equipment for the new factory of the Geo. E. Keith Company, and are now equipping the M. F. Thomas factory in like manner. In both factories the Webster vacuum system of steam heating is used.

Bogue & Oates, 571 Detroit street, Cleveland, Ohio, have secured from the Police Department of the city of Cleveland the contract for a steam heating plant in the Sixth Precinct Station House, where they will use a No. 6 Champion Steam Heater made by the Thatcher Furnace Company.

Clifford Schlemmer, who is the Eastern agent for the O. S. Distributing Fittings manufactured by Oliver Schlemmer, Cincinnati, Ohio, informs us that the demand for these Fittings has been such as to necessitate the carrying of a large stock in New York City so that orders can be filled promptly, and that he has secured warehouse space, and orders placed at the New York office, at 109-111 Beekman street, will receive prompt attention.

The Clarence H. Rose Mfg. Company, 96 Centre street, New York, send us a budget of printed matter in which they show Quarter Bends, Slip Joint Connections for water closets, a Closet Nut and Tail Piece, a Nickel Plated Slip Joint Nut and Flange, and a circular showing by means of half-tone engravings a variety of Lavatory Legs, Nickel Plated Basin Supply Pipes and Conductor Strainers. Prices are given on the circulars, which will be sent to all who desire them.

Arnold Behrer, who for a number of years has made acquaintances in the plumbing trade as a representative of Peck Bros. & Co., is now on a trip among the trade for himself, having recently taken an interest in the plumbing supply house established by Behrer & Co. at 69 Beekman street, New York.

The business of the season is making things lively for the Nason Mfg. Company, 71 Beekman street, New York. They inform us that the demand for Pipe, Fittings, Steam Traps, Valves, Radiators, Equator and Gulf Stream Boilers is quite brisk and a very pleasing tribute to their efforts to meet the requirements of the trade.

At the regular monthly meeting of the Vance Boiler Works, Geneva, N. Y., it was reported that all of the stock of the company was sold, and that the company had been obliged to light the plant by electricity so that an increased force of men could be worked in order to fill the orders that have been placed with them.

The Mulhern Steam Heating Company of New York City have been incorporated, with a capital stock of $50,000, to manufacture Steam Heating Appliances. The directors named are James F. Mulhern, John T. Easton and Richard K. Cooke of New York City.

The John Simmons Company, 106-110 Centre street, New York, are sending to the trade what might be termed an emergency notice. It is addressed to "Fitters and Foremen," and states "we have arranged with our foreman, J. Kenny, to wait upon you in cases of emergency. He holds the key of our pipe cutting shops and warehouses at his residence at 157 Grand street, New York, and will deliver material for rush or breakdown jobs on Sundays and holidays."

The Schlafer Hardware Company, Appleton, Wis., have recently secured a large contract for furnishing the sheet iron piping for the heating system at the mill of the Falls Mfg. Company at Oconto Falls. The heat will be taken from steam coils and distributed through the mill by a Sturtevant blower. The pipes range in size from 38 inches in diameter downward.

O'Keefe & Long, Appleton, Wis., were awarded the contract for plumbing in the addition of the Sherman House. The plumbing includes 11 closets, four and perhaps eight bathtubs, six basins and heating apparatus for same.

We have received from the John Simmons Company, 106 Centre street, New York, a sample of the Black Diamond Steam Hose, another specialty put out by this Iron Pipe, Fittings and Steam Supply House. The Hose is presented as having an indestructible cover and a steam proof tube, with the statement that the best grade of Steam Hose is cheapest in the end. The inside tube is made of a special compound said to be proved by experience to resist the destructive action of steam, while the cover is claimed to be particularly tough and practically indestructible. Marlin winding is recommended where the pressure exceeds 80 pounds or to protect the Hose from cinders. Sizes and prices are given on a card accompanying the sample.

The Brainerd, Tanner, Gallien Company, 72-74 Church street, Albany, N. Y., have just been incorporated, with a capital of $25,000, which it is said is all paid in. The Dickson plant has been secured and is now being rearranged to manufacture Builders', Piano, Cabinet and Plumbers' Hardware, Dickson Transom Lifters and Openers and Hardware Specialties. The officers are B. M. Gallien, president and treasurer; H. J. Brainerd, vice-president, and W. F. Tanner, secretary. The company have a salesroom and office in New York at 107 Chambers street in charge of H. J. Brainerd.

The United States Secretary of Agriculture in his annual report to the President recommends that agents of the Department of Agriculture should be stationed at each of the important American embassies abroad for the collection of information of interest to American farmers.

It is in contemplation to build an extension of the Philadelphia & Reading Railroad from Reading, Pa., to Chesapeake Bay, at some point at which deep water can be obtained. The idea of the extension is to convey iron ore, coal, &c., from the mines to tide water, where it is proposed to locate a manufacturing town.

A cable dispatch from Constantinople, Turkey, says that agents of Armstrong's Elswick Works, in England, and of the Krupps of Essen, Germany, are now in that city with proposals for the reconstruction of the Turkish Navy. The contest between the British and German interests in this matter is being keenly watched.

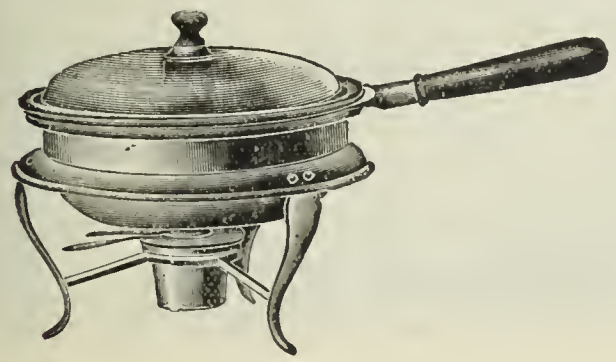
THE RETAIL STORE.

Cleaning Aluminum Ware.

One reason why aluminum utensils and other ware have not found more favor with the general public is, in all probability, because the proper method of keeping the ware in order has not been known. Reymond & Gottlob, 831 Broadway, New York, who handle a very large line of aluminum goods, advise us that they have only lately discovered that the preparations which are generally used for cleaning silver are inimical to aluminum. Soda or ammonia, in particular, should never be used for the purpose. Polished aluminum ware in general use should be cleaned with plain water only, a little fine sand being employed in case the inside of the article becomes dark from the food. If the outside becomes dull special aluminum polish, with a little whiting, should be used. Satin or frosted finished articles should be cleaned with soap and water when soiled. If these directions become known they believe that aluminum cooking and table ware will become more appreciated by the public.

Aluminum Chafing Dish.

Reymond & Gottlob, 831 Broadway, and Havemeyer Building, 26 Cortlandt street, New York, are placing on the market the new aluminum chafing dish, illustrated herewith, which they claim to be, for efficiency, economy and simplicity of operation, equal to any chafing dish in the market. The best method of using the dish is described as follows: 1. Remove the water bowl, and bring the cooking dish into direct contact with the lamp. 2. Have the water bowl at hand full of boiling water. 3. When ready to serve put back the water bowl, and the lamp can either be extinguished or allowed to burn, but under any circumstances the food will be kept hot. It is



Aluminum Chafing Dish.

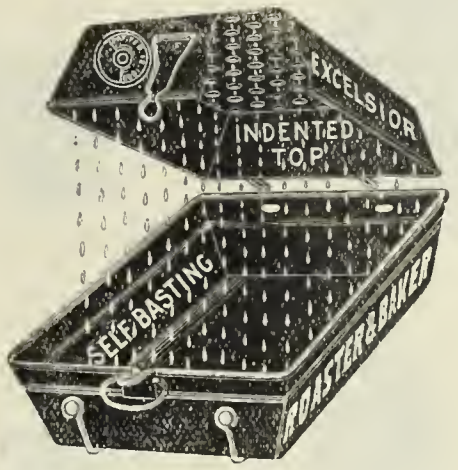
pointed out that a chafing dish in this form and made of aluminum possesses many advantages, being light in weight and easily handled, attractive in appearance, durable, easily cleaned and absolutely wholesome. On account of the high heat conducting qualities of aluminum the dish has, moreover, a special advantage as a quick cooker. Its price is referred to as being as low as that of the best made nickel plated chafing dish. The dish, stand and lamp are of spun and stamped aluminum, and the handle of black wood.

Aluminum Supplies.

The Pittsburgh Reduction Company on November 1 closed their New York store at 10 and 11 Havemeyer Building, Cortlandt and Church streets. The company have arranged that the firms of Patterson Bros., metal dealers, 27 Park row, and Reymond & Gottlob, who have gone into occupation of the former premises of the Pittsburgh Reduction Company in the Havemeyer Building, will each carry a retail stock of aluminum in the form of ingots, plates, bars, sheets, rods, wire and tubing, to supply the local demand for these materials in and around New York City. All large orders the Pittsburgh Reduction Company request to be sent to them at Pittsburgh, Pa. B. C. Bakewell, who has been connected with the Pittsburgh Reduction Company for the past five years at their works at New Kensington, Pa., and at their Chicago and New York branches, remains as manager for Reymond & Gottlob. The last named firm will carry a very full stock of aluminum of all kinds at their new store, as well as an extensive line of aluminum household utensils and novelties. Reymond & Gottlob's headquarters will continue to be, however, as heretofore, at 831 Broadway, New York.

Excelsior Self Basting, Roasting and Baking Pan.

Barber-Koenig Mfg. Company, Hazleton, Pa., are putting on the market the Excelsior roasting and baking pan, illustrated in the accompanying illustration. The spe-



Excelsior Self Basting, Roasting and Baking Pan.

cially new feature of this pan is the indented top, which makes it self basting, the steam rising to the top of the pan and condensing, dropping back upon the roast at the points of indentation. The wire shoes shown are designed to prevent burning of contents and allow free circulation of heat under the pan, thus doing away with the inside tray or grate. It is stated that the top pan fits inside the lower pan, and hence the steam rising to top pan and condensing must run back into the lower pan and not into the oven. Ventilators are provided allowing a current of air in and out of the pan, and a proper adjustment of these enables the cook to roast or bake to suit family requirements. The manufacturers refer to the simplicity of construction of the pan as making it easy of adjustment, readily handled and easily cleaned, besides securing durability. The pans are made of planished and tri-color steel in seven sizes, varying from 6½ to 14 inches in width, 10 to 19 inches in length and 5 to 9 inches in depth.

Retail Hardware Organization.

The following letter from a prominent house in this State will be read with interest, suggesting as it does the necessity of organized effort among retail hardware merchants in the East for their protection against department stores and catalogue houses and the interference with their customers by jobbers and manufacturers. From the way in which our correspondent refers to the matter it is evident that the energetic efforts which are being made in the West are directing attention to the evils which confront the trade in other sections:

Have been reading with great interest for some time discussions regarding Minnesota Retail Hardware Association, besides other movements in the West, and wondering why it is we dealers in the East sit idly by and see our brethren working assiduously to bring about a state of affairs which would certainly be much more pleasant than at present.

Time was when the hardwareman could do a good business and lay aside a small amount for a time when he should be relegated to the past, but now, with the incubus of department stores and catalogue houses, and would-be wholesale retailers, and with manufacturers and large jobbing houses, the regular retailer has hard work to live —indeed, at times feels he must take his pick and shovel and go on the street, provided he has a "pull;" otherwise he could not do that.

The stores mentioned above are a curse to the country at large, and I think the retailers of the East should make some move to better their condition before it is everlastingly too late. The jobbers and manufacturers are greatly to blame for supplying the octopus.

Why cannot some move be made to start a retailers' association ?

Will you, through your paper, bring this matter to the notice of the retail hardware merchants and see if the East has not as much "git up and git" as our brethren in the West.

Novelties in Enameled Ware.

Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, have brought out a number of new articles in enameled ware. Fig. 1 is a seamless pitcher with swinging and side handles. This is designed for the use of hall boys in hotels answering calls from guests for ice water, the supply being carried in this receptacle and emptied into the earthen pitcher in the room. They are made in

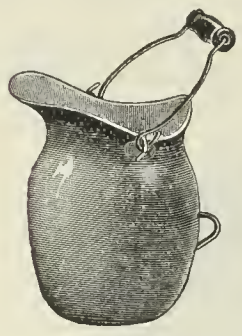


Fig 1.—Hotel Ice Pitcher.

Fig. 2.—Gravy Boat.

Fig. 3.—Syrup Cup.

Fig. 4.—Mustard Cup

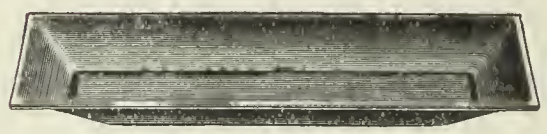


Fig. 5.—Candy Pan.

3 and 4 quart sizes. Fig. 2 represents a seamless gravy boat, with a capacity of 1 pint. Fig. 3 illustrates a syrup pitcher, holding 3 pints, and is fitted with a metal cap. Fig. 4 shows a mustard cup, size 1 gill, with detached enameled cover. Fig. 5 illustrates a seamless rectangular candy pan, the dimensions of which are 22¼ x 8¼ x 1⅞ inches. This is made in white enamel with blue border only, the other articles being the usual mottled enamel. In addition to the goods illustrated the company are making new lines of seamless water and toilet pitchers, seamless toilet bowls and extra large cereal and fruit cookers, with bails, having capacities of 6, 9, 14 and 18 quarts.

Aluminum Chafing Dishes.

The accompanying cuts represent aluminum chafing dishes put on the market by the Illinois Aluminum Com-

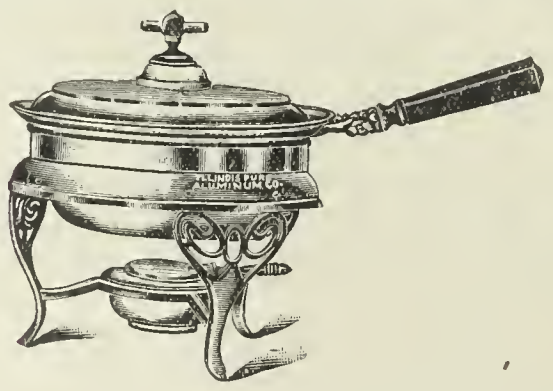


Fig. 1.—Aluminum Chafing Dish No 3.

pany, Lemont, Ill. No. 3, shown in Fig. 1, has cast aluminum legs and polished chafing dish and water bowl, finished with ebony knob and handle. The handle of the chafing dish fits into a cast aluminum socket. It is referred to as not only a neat and serviceable dish, but also as comparatively inexpensive. The dish shown in Fig. 2, and catalogued as No. 5, is more elaborately ornamented and is higher in price. It has a cast aluminum stand. The water bowl and chafing dish are highly polished, and

Fig 2.—Aluminum Chafing Dish No. 5.

the water bowl has two cast handles of black ebony. The handle fits into a cast aluminum socket. The whole dish is spoken of as being well finished in every respect.

Steam Cereal Cooker.

Sidney Shepard & Co., Buffalo, N. Y., are marketing a steam cereal cooker, as illustrated herewith. The utensil consists of a large lower pan to hold the water, a rack to hold the upper pan or food receptacle and an upper vessel to receive the food material. In use the hot, moist

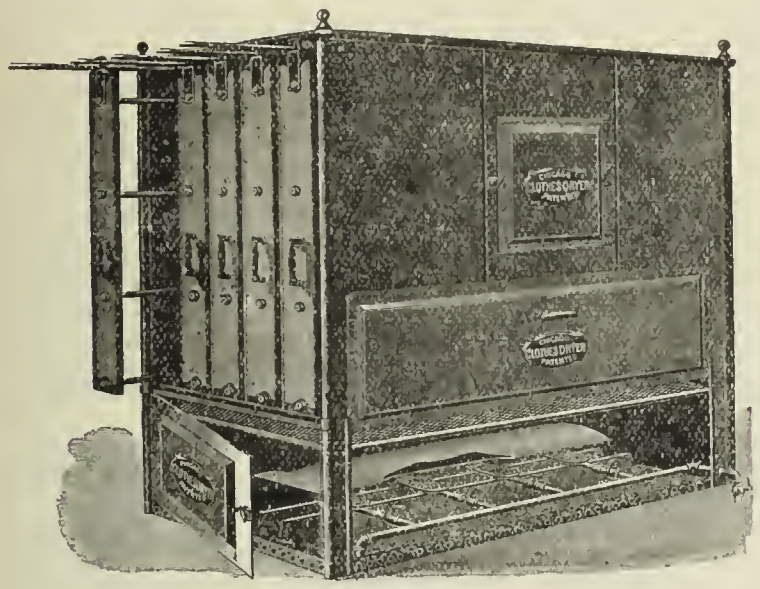
Steam Cooker for Cereals.

steam rises through the small holes in the rack, and finding a reservoir formed by the cover and food pan, circulates over and through what is being cooked. In this way cereals can be thoroughly cooked without danger of being scorched or requiring much attention.

The Chicago Laundry Clothes Dryer.

An illustration is herewith given of a gas heating laundry clothes dryer now being manufactured by the Chicago Clothes Dryer Works, 65 South Canal street, Chicago. The operation of this apparatus is readily understood from the cut. It is intended to enable laundry work to be completed indoors, avoiding the unsightly "wash" hanging in a back yard, together with the discomforts of hanging out clothes in disagreeable weather and having them perhaps subjected to soot or dust while in the open air. The dryer contains racks which slide in and out. The clothes are hung on the racks as soon as they are washed and wrung. With the gas burners in operation below, the drying proceeds nearly as fast as a laundress can wash. It is substantially made of metal throughout, so as to be thoroughly fire proof, while the parts are galvanized so that they will not rust. The gas equipment consists of atmospheric air burners, effecting perfect com-

bution. The heat is distributed equally throughout the dryer, and a system of ventilation insures bleaching as well as would be done by sunshine. The dryers are built of various sizes, and can be made specially to suit a given space. The company manufacture a variety of styles. One form of dryer which is very popular has a steam coil in place of gas burners for use where steam is available.



The Chicago Laundry Clothes Dryer.

They also make a combination laundry stove and dryer, the stove not only heating the dryer but also being available for boiling clothes and heating sad irons.

MEMORANDA.

Austin Wells, manufacturer of Tinware and Roofing, Muncie, Ind., is erecting a two-story brick building for his business on Howard street, in that city.

Keen & Hagerty, Baltimore, Md., are among the latest concerns who have taken up the manufacture of Enameled Ware. They are producing a handsome line of Household Utensils under the name of Gray Flint Ware, which are now being placed on the market. The firm's large factory at Baltimore is reported as busy in all its branches, turning out a very large output of Tin, Galvanized, Japanned and Enameled Ware, for all of which an active demand is experienced.

Lewis D. Wynn, Sterling, Ill., reports his business as nearly 100 per cent. better for July, August, September and October of this year than for the same months during 1896. Mr. Wynn states that he has made some improvements in his machinery for the manufacture of the Black Silk Stove Polish and also in the Polish.

Kieckhefer Brothers Company, Milwaukee, Wis., have been compelled by the large increase in their trade to add more room to their already great plant for the production of pieced and stamped Tinware, Granite Steel Ware and other sheet metal goods. They are adding two stories to one of their buildings which was erected only three years since, extending 300 feet along St. Paul avenue, and building an ell 50 x 200 feet. The increase thus made in their floor space will be about 50,000 square feet.

The Diamond Stamped Ware Company have organized at Detroit, Mich., with a capital of $50,000, to manufacture Tea Kettles, Coffee Pots, Saucepans and other utensils of copper and brass. The plant of the new company is located at River and Clark streets, in the building formerly occupied by the Galvin Brass & Iron Works. The directors are Oliver Goldsmith, R. W. Gillett, L. H. Jones, W. A. Montgomery and C. D. Milne.

The tin shop of J. W. Maxim, Warren, Mass., was destroyed by a fire which practically wiped out the business section of that town on October 31. The loss is placed at $3000, partly covered by insurance.

A. W. Pritchett has taken charge, as manager, of the New York branch of Keen & Hagerty of Baltimore, Md., at 101 Beekman street, in succession to S. W. Milligan, who has been obliged to retire from business on account of ill health. Mr. Pritchett has traveled in the interests of Keen & Hagerty for a number of years through the States of New York, New Jersey, Pennsylvania and Ohio and is well known to the trade at large.

The Morse Hardware Company, New Whatcom, Wash., are building an addition to their establishment. The addition will be 27½ x 60 feet in dimensions, two stories, and is referred to as an actual necessity to meet the requirements of their increasing business. The enlarged establishment will have a floor space of 10,174 square feet, exclusive of tinshop and warehouse. The company do a wholesale and retail business in Hardware, Stoves, Tinware, Iron, Steel and Mill and Mining Supplies. Trade is alluded to as steadily improving.

F. W. Myer has opened a new Hardware store at Manitowoc, Wis. Mr. Myer is a retailer of Shelf Hardware, Stoves, Tinware, Sporting Goods, &c. He refers to his store as one of the neatest in the city, with hardwood floor and electric lighted.

J. L. Swank has opened a new Hardware store at Colusa, Cal., carrying Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements and Sporting Goods.

C. D. Foard, Wilmington, N. C., has removed his stock into a more commodious building at 29 South Front street. Mr. Foard handles a general line of Hardware, Stoves, Tinware, Sporting Goods, &c., dealing both in wholesale and retail business.

J. A. Plumley, 430 East Twenty-third street, Baltimore, Md., is manufacturing the Plumley fruit picker, which is intended for picking apples, peaches, pears, plums and oranges. The picker consists of a handle 10 feet long, and what is called a conveyor, which is 12 feet in length. This combination is referred to as suitable to pick any ordinary tree, but the handle and conveyor can be lengthened by splicing to pick any fruit tree. In using the device the fruit after being detached from the tree is transferred by means of the conveyor to the basket, barrel or other receptacle. By placing the hand at the opening at the lower end of the conveyor it is pointed out that all bruising of the fruit is avoided. The picker weighs 2 pounds complete, and is referred to as very durable and easily handled by a woman or child.

D. W. James, Jr., a Hardware salesman of long experience and wide acquaintance, has located in Chicago, in room 603, at 60 Wabash avenue, representing the Haberman Mfg. Company of New York.

Kieckhefer Brothers Company, Milwaukee, Wis., last week shipped two carloads of their goods, embracing a full line of Tinware and Granite Steel Ware for household equipment, to Honolulu, Hawaiian Islands.

D. McGregor, formerly a dealer in Farm Implements exclusively, at Caledonia, Ontario, has made a number of improvements in his establishment and has enlarged his stock by the addition of a line of Hardware, Stoves, Tinware, Glass, &c.

A new Hardware store will shortly be opened at Grafton, N. D., by J. A. Douglas. Mr. Douglas will handle Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

J. R. Silkenson, dealer in Harness, Alsen, S. D., has added a full line of Shelf and Heavy Hardware, Stoves and Tinware. Mr. Silkenson has also erected an addition to his store, 18 x 20 feet.

John Watson has lately opened a new Hardware store at 712 Elmwood street, Port Huron, Mich., handling in a retail way Shelf Hardware, Stoves and Tinware. Mr. Watson advises us that business is opening up well and that the prospects are encouraging.

C. A. Hedlund & Co. have succeeded A. P. Erickson in the retail Hardware, Stove, Tinware and Sporting Goods business in Holdrege, Neb.

The Evart Hardware Company, Evart, Mich., wholesale and retail Hardware, Implements, Crockery, Harness, Lumber, &c., have added a Stove department to their business. The wareroom devoted to this line is 44 x 60 feet in dimensions and is, we are advised, an especially attractive and convenient one.

Anthony Wayne Mfg. Company, Fort Wayne, Ind., Neal & Brinker, Eastern agents, 168 Church street, New York, have added to their list the Cyclone churn, which is made in three sizes, Nos. 1, 2 and 3, churning 4, 6 and 8 gallons respectively. They have also commenced the manufacture of the I X L bread board, and Nox All ironing table.

Newton A. Ballard and Arthur M. Clark of Webster, Mass., have purchased the Hardware and Furniture business of J. E. Taylor, Putnam, Conn., and will continue it at the old stand under the style of Ballard & Clark. A wholesale and retail trade is done in Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Crockery, Furniture, &c.

Statistics just issued by the Department of Internal Affairs of Pennsylvania show a marked falling off in the production of coke in that State last year. The output for 1896 was 6,613,180 tons, as against 8,922,329 tons in 1895.

TIN PLATES.

Tin Scrap.

In the course of a recent conversation with a broker in scrap metals, the information was developed that there is a very large and steady export movement of tin scrap from the Atlantic Coast to Europe. The amount of tin plate clippings made by the large tinware and can making factories of the country is very considerable. Some of the more extensive works in this line put out from 50 to 100 tons of scrap tin monthly. This material, in most instances, is sold to exporters under a yearly contract. It is baled at the factory and shipped to Antwerp, from whence it is sent to a separating works in Holland, where, by a special process, the tin is recovered and made into pigs, while the steel scrap is sold for various purposes. The average value of the tin plate scrap, in bales, delivered at the dock in New York is about $5 a ton. Some of the smaller tinware factories, which have no facilities for baling their scrap, dispose of it loose to the manufacturers of sash weights.

SCRAP.

Arrangements have been made by the Granite City Steel Works, Granite City, Ill., to put down a universal mill to roll Structural Material, Sheet and Tin Plate Bars, Blooms and Billets, &c.

It is understood that the arrangement referred to lately in these columns whereby the interests of the Shenango Valley Steel Company, the Shenango Tin Plate Company, the Neshannock Furnace and the New Castle Steel & Tin Plate Works, all of New Castle, Pa., are to be consolidated, will not go into effect in its entirety until the spring.

The plant of the Pennsylvania Tin Plate Company, New Kensington, Pa., is to be enlarged by the addition of two new hot mills, for which the contract has been given to the Frank-Kneeland Machine Company, Pittsburgh, Pa. This will make the Pennsylvania a six-mill plant. The present engine power will be sufficient to drive the new mills.

Late cable advices from England report that several of the Welsh Tin Plate works have been shut down owing to a portion of the workmen refusing to accept the reduction of 15 per cent. agreed to by the Tin Plate Workers' Union.

The latest industrial returns of the British Board of Trade show a continued falling off in the Welsh Tin Plate industry. At 87 works, at the beginning of October, only 273 mills were at work, while 211 were idle, out of a total of 484. In 1896 at 88 works there were 306 mills working and 176 idle, out of a total of 482.

There seem, from latest accounts, to be an increasing number of defections from the ranks of the Tin Platers' Union in South Wales. At the Morfa Tin Plate Works, Llanelly, an agreement, to last for three years, was recently signed by the men whereby the latter consented to sever themselves altogether from the union, while the owners agreed to pay during that period the average rate of wages in the trade. The Morfa Works have now been started up on this footing after a long period of idleness. Taken together with the news cabled last week that the union had decided to accept a reduction of 15 per cent. from the 1874 wage list, this seems to mean a defeat for the cause which the officials of the union have been fighting for so persistently—namely, the maintenance of the 1874 list. Under the present depressed condition of the Welsh Tin Plate industry and the low prices for their product it would be surprising if the makers could continue to pay the same wages they were giving 23 years ago, when prices were at nearly double the present level and the United States furnished them with a large and steady market.

The American Tin Plate Company have just issued from their sales office, 1118 Marquette Building, Chicago, a quotation sheet, D, giving prices on their various brands of Tin and Terne Plates and Taggers Tin. Base prices are given on 14 x 20 Plates, 112 sheets to the box, and arranged under six heads—namely, Kanner and Koko, Kream, L-Wood, Charcoals, Taggers, and Ternes—on each of which a base price is given. The prices of the different varieties of Plates are calculable by means of a table on the system introduced by the American Tin Plate Company some time back and fully described in these columns. Thus, for Koko Coke Plates 5 cents a box advance on the base price is charged for 80 pounds, 7½ cents for 85 pounds, 10 cents for 90 pounds, 15 cents for 95 pounds, 20 cents for 100 pounds, 30 cents for IC, 80 cents for IXL and 90 cents for IX. A similar plan is followed for all the other Plates manufactured by the firm. Wasters, IC and lighter, are 25 cents a box less and IXL and heavier 35 cents less than primes.

It is reported that the Atlanta Steel & Tin Plate Company, Atlanta, Ind., are contemplating building a large addition to their plant.

Ground was broken last week for the erection of a new Tin Plate plant of the Johnstown Tin Plate Company, at Johnstown, Pa. It will be remembered that the Totten & Hogg Iron & Steel Foundry Company of Pittsburgh have the contract for the erection of this plant.

The dimensions of all the buildings for the new Tin Plate plant of the Shenango Valley Steel Company of New Castle, Pa., have not yet been arranged. The size of the main building has been determined, and it will be 108 feet wide and 1152 feet long, with two leantos of 27 feet each. The boiler house will be 40 x 170 feet by 34 feet high. The contract for these buildings has been placed with the Shiffler Bridge Company of Pittsburgh. It has been definitely decided to locate the new plant between New Castle and Mahoningtown, where a site of about 40 acres has been secured.

The American Tin Plate Company, Elwood, Ind., have started their new automatic Bar mill, rolling tin plate bars from 6 x 6 standard steel billets, weighing 800 to 900 pounds. The product of this mill is 250 tons single turn. It is only intended to run single turn at present, as the output is sufficient for the existing capacity of their finishing departments. The mill is modern in every respect, having the most approved labor saving devices.

As announced in these columns last week, the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., will make some extensive improvements and additions to their plant. They have decided to do away with their Bar Mill and are at present dismantling it. The concern will have for sale a Bar Mill, Squeezers, Heating, Puddling and Scrap Furnaces.

Recently there has been a very large influx of tin plate workers to New Castle, Pa. They are attracted to that place by the fact that two large tin plate plants are about to be erected there.

Charles G. Smith, who is a manufacturer of carriage lamps, lamps and lanterns, at 352 Pearl street, New York, has opened a branch at 96 John street, New York.

The yellow fever epidemic in the South is subsiding.

The George L. Squier Mfg. Company of Buffalo, N. Y., are now equipping some 170 school buildings in Chicago with Crystal Fountain Filters. They have also just been awarded the contract by the United States Government for putting Crystal Fountain Filters in the District of Columbia schools.

I. P. Frink, 551 Pearl street, New York, advises us that he has recently installed his patented system of reflectors in the art galleries of the following well-known department stores : Abraham & Straus, Brooklyn ; Bloomingdale Bros. and R. H. Macy & Co., New York ; Hahne & Co., Newark, N. J.

The largest single cash purchase of oil territory ever made by the Standard Oil Company has just been concluded by the acquisition of the Chipmunk oil field, near Titusville, Pa., for the sum of $1,400,000. The holdings purchased were owned by the Emery, Devonian and Matson oil companies, and possess an aggregate of 425 wells, with a daily output of 5000 barrels.

STOVE TRADE NOTES.

THE NEW YORK STOVE TRADE.

The stove trade has not reflected the improved conditions in general trade, as it was expected to. The volume of business done at this time of the year depends altogether upon the weather, and that factor must be taken into account in all calculations or estimates made at the threshold of the fall trade or they are liable to be wrong. October is one of the vital months in the stove business and the aggregate of sales this year was far from satisfactory. The weather was very unfavorable almost throughout the month and in the best of times would have affected the trade, so that in a year like the present, when the country is but just emerging from a long period of depression, dealers are apt to pursue a conservative course if the weather is not such as to compel the purchase of stoves for immediate sale. To stock up in spite of unfavorable weather conditions constitutes too much of a risk at a time when bank accounts are not plethoric and carried over stocks must be paid for. The adverse weather conditions have robbed the stove people of a share in the first flush of returning prosperity, which nobody will deny they needed as much as any other line of trade.

On the other hand, it is not impossible to make up all that may seem to have been lost by bad weather and not improbable that it will be made up if cold weather comes soon. Trade gets later every year and is much later than it was five or ten years ago. The manufacturer has to carry the stock and dealers more generally order from hand to mouth. The manufacturer is obliged to keep in close touch with the dealer because of his manner of ordering fewer stoves and oftener. Salesmen who a few years ago were compelled, with the advent of September, to cease their daily rounds and remain in the stores to help floor salesmen, now keep canvassing throughout the season. Responses are quicker when the weather changes cold than formerly, and, *vice versa*, trade stops quicker when it turns warm again.

In former years, when dealers carried larger stocks, the traffic was more steady; orders were for full lines of stoves, sundries and repairs; larger loads were delivered and the stocking up period was one of much activity and much business, but steady, rational and satisfactory. Nowadays the trade is fraught with disappointment at the smallness of orders, which no amount of urging will suffice to enlarge, and with hurry and feverishness when the weather excites demand. Everybody wants a few stoves at once and nobody can wait a minute, and if they are not delivered one day and it should be warm the next they are countermanded and sent back. It is no unusual thing on a warm day for the wholesale stores to be as dull as on Sunday and the next day, if cold, for everybody to be head over heels with business. The telephone will keep ringing the entire day, messengers and errand boys will run in with orders, extra trucks must be hired and sent flying in every direction and the ordinary work of three days crowded into one. The exactions on the patience, nerves and health of those concerned in the wholesale stove business are vastly greater than ever known in the history of the industry, and it may almost be said that so far as the pleasure of doing business is concerned there is none.

No business in a staple article like stoves can be conducted indefinitely on an unprofitable basis, which the abuses of the past few years have brought the stove trade to, and if returning prosperity does not stimulate demand up to the capacity of existing foundries to work its own corrective, it seems evident that some agreement for the reform of such abuses must be made by the wholesalers.

THE VENTING TOOL.

BY THOS. F. KENNEDY.

When making molds for iron castings in very close clayey sand it is necessary, even with very small ones, to resort to mechanical means to make the sand more porous. It is also necessary in the case of thin castings of large area or thick ones of certain shapes, even when made in the most open sand that can be used in the making of green sand molds, first, to allow the free escape of the air in the mold and sand ; second, to carry off the steam generated when the molten metal comes in contact with the damp sand ; third, to provide for the escape of the gases contained in the metal and of that produced from the facing and sand by the heat of the metal.

On small and medium size castings made from patterns and rolled in a flask, and even on large ones made thus, artificial porosity is obtained by what molders call venting—that is, by piercing the sand of the mold from the outside to or nearly to the pattern with a metal rod or wire. I do not propose to touch on work bedded in the floor, or very heavy work; for while the principle is the same the treatment is necessarily more elaborate. The vent wire or rod is the most essential of the molders' tools. Some makeshift can be contrived instead of any one of the other tools, but for venting through a hard body of sand he needs a metal wire or rod.

The venting tool is without doubt the crudest that can be found around a foundry. Whatever the metal used by the earliest molders, whether iron, copper, steel or bronze, their venting tool could not have been more primitive than those in use in the most up to date foundries of today. This cannot be truthfully said of any other tool or part of the equipment of a modern foundry.

Old discarded umbrellas with round ribs of spring steel furnished the material for nearly all the small vent wires used in stove foundries in the last decade. This source of supply will not last much longer, as the umbrellas made in the last few years have ribs of a thin strip of steel bent to the shape of the letter U. A molder cuts off the desired length from one of these round ribs, and at least in one-half the cases proceeds to use it forthwith. Sometimes he puts a wood handle on it, or he may grind it off at an angle of 30 to 40 degrees. Whether he puts a handle on it or grinds it, the end used to pierce the sand becomes worn in a short time to the size of a needle for the first inch or so from the point.

I have seen molders using these umbrella rib vent wires when they did not exceed 1-100 inch in diameter ¼ inch from the point, and I am sure nothing but a lack of knowledge how to compute areas from known dimensions and compare them ever kept the molder at work pushing his vent wire into the mold 100 times to obtain a venting area hardly equal to 1-100 part of a square inch. I do not want to convey the impression that I am of the opinion that a few large vent holes are as good as numerous small ones. What I want to call attention to is what very little good a vent wire does when it is worn to the dimensions of a needle near the point and does not make its maximum size hole till 2 or 3 inches from the point.

I believe it is well within the facts that have come under my observation to say that 99 out of every 100 molders, if asked the difference in area between a hole ⅛ inch diameter and one ¼ inch diameter, would say the latter was twice the size of the former and would be still more confused if asked the difference between a circle 1-64 inch diameter and one 1/16 inch diameter. I append herewith a table of areas of circles the diameters of which are frac-

tional parts of an inch, which will enable any one to make comparisons.

Areas of Small Circles.

Diameter of circle.	Area of circle in decimals.	Area in common fractions.	Number to 1 inch diameter.	Number to square inch.
1/64	0.0001932	1/5100	4096	5100
1/32	0.00076	1/1300	1024	1300
1/16	0.0029	1/340	256	340
3/32	0.0068	1/145	113	145
1/8	0.012	1/84	64	84
3/16	0.027	1/37	28	37
1/4	0.049	1/20	16	20

For instance, comparing 1-64 inch diameter with 1/8 inch diameter, we see that 1/8 inch has an area 64 times greater than 1-64 inch diameter ; while it requires over 5100 holes 1-64 inch diameter to equal an area of 1 square inch, it only requires 84 of 1/8 inch diameter.

I believe most of the loss from scars can be traced to improper venting, also much of the loss from flat gates blowing and breaking down can be traced to the same cause ; not but what the molder uses his wire enough—in fact, he uses it far more than would be necessary with a properly made venting tool. In thin castings, no matter how large in area, you want quick action from your vent holes ; the air in the mold should begin to escape through them the moment the metal enters. Yet they should be so made that the metal cannot enter them, for if it does that ends their usefulness, nothing having escaped through them but the air in the sand, which is greatly expanded in volume by the heat, leaving the steam and the gases to escape through the sand as best they can, which is often badly, and the result is scars and blow holes. I hold that on thin castings the wire should touch the pattern, and stove molders, as a rule, follow this practice, though in some quarters the wisdom of it is questioned, owing to the liability of the metal to enter the vents. This happens when the molder begins to use a new wire cut off straight, which leaves a hole that the metal can easily enter. Later on, when this wire becomes worn to the size of a needle, neither metal nor anything else will enter the vents unless when venting at an angle the wire slips. But when it is worn down so small at the point, and the hole does not reach its maximum size until 2 inches from the pattern, it is impossible to get the quick action which is so desirable on thin castings.

Five minutes' work on a piece of steel wire and a vent wire can be made which will make the hole its maximum size 1-16 inch from the point. With this one can vent to the pattern with it without fear of the iron entering the hole, and if the metal is the right kind it will last a lifetime.

HOW TO MAKE A SMALL VENT WIRE.

I can hear the wiseacre, the shop oracle, the man who does not believe in learning a trade out of a book, and others of that ilk, if they see this chapter, repeat sneeringly the words in the title of it. Nevertheless, I believe that not more than one in five is made at all, and there are hundreds of foundries in which not one can be found that is made right.

The umbrella ribs mentioned are too small for vent wires anyhow, all I have measured being scant 5-64 inch diameter. Wire 3-32 inch diameter is small enough, requiring 145 holes to give an area equal to 1 square inch.

When you have the wire of right diameter and length and straightened, put it on the grindstone or emery wheel and grind it to a sharp point at an angle of 90 degrees. Be sure and get it even and the point very sharp. Go now where there is a small hot fire and heat the sharp end to a good red heat for about 1/8 inch, then plunge it into cold water and leave it there till cold. If it gets hot too far up the wire it is liable to break, but if you heat it quickly and have a good piece of steel the point of your wire will be nearly as hard as a diamond and will wear above the point first. One may vent to a pattern with this wire without any fear of the iron entering the vent, for the reason that the point is a true point, having no dimensions, whereas wires that are simply worn sharp by use and not hardened have about the same diameter at the extreme point that they have 1/8 inch from it. This is sure to be the case when they are used to vent to metal patterns. But even when not venting to the pattern, soft steel will never take a perfect point. If your wire is 1-16 inch diameter a 90-degree angle at the point will bring the maximum size of the vent holes within 1-32 inch of the pattern ; if 1/8 inch diameter, within 1-16 inch. In venting to a metal pattern at an angle with an untempered wire it is liable to slip, leaving a hole which the iron will enter instead of a vent hole; with a wire ground sharp and tempered hard this will never occur.

HANDLES FOR VENT WIRES.

I can never understand why molders go begging old file and screw driver handles from carpenters and machinists for vent wire handles, when they have a material at hand, in the iron they work, which is more easily attached to the wire, more durable and better from every point of view. It gives the tool weight and less exertion is required in venting through a body of hard rammed sand. If venting over a wood pattern and you want to strike it light or not at all, the weight of the tool gives more control over it and enables one to gauge more accurately the force of a blow, as with a very slight impluse at the start the combined momentum and force of gravity will drive a small wire to the pattern in a flask of ordinary depth.

Hardly any two molders handle their vent wire exactly alike. It is probable that this follows natural causes, as thick or slender, long or short fingers, or the strength and grasping power of the hand and fingers. A great many molders, even when they have a handle on their vent wire, never use it, but catch the wire below the handle between the thumb and forefinger. Many others place the forefinger on the end of the handle and the thumb on one side, and the second and third finger on the opposite side of the wire or handle. For all molders following either of these practices I would recommend an inverted cone of iron for a handle—that is, so the base or flat part would be uppermost when venting. It is a very convenient shape, and if an inch or 1¼ inch diameter at the base, when dropped, handle down, on any level or nearly level surface, as on the top of a finished mold, it will stand up straight, out of the way, yet within reach and easily located when needed again. To make a cone shaped iron handle get a piece of tin and cut it to the outline size of the cone you desire to make. A triangle with sides 1¼ or 1½ inches long will be right for a wire from 1-16 to 1/8 inch in diameter. Have a pile of sand deeper than your wire is long. Level off the top a little and, using the triangle for a sweep, cut out the shape of a cone. Bush the wire point down through the sand at the vertex of the cone until it is deep enough so that there will be 1/8 inch of metal to cover the end of it, pour a drop of not too hot metal into it and the handle is made. The whole operation should not take as long as the telling. Other shapes that can be made in this way are cylinders, squares and hemispheres. Still other shapes, as ovals and spheres or file and screw driver handles, can be molded in the usual way casting the wire in.

LARGE VENT WIRES.

Users of large vent wires are far in advance of those using small ones in adapting the tool to their needs by giving it a square pointed head with angles 25 to 30 degrees, and larger at the largest point of the head than the shank of the wire, thus eliminating friction except on the very limited surface of the head. Although vent rods with spear heads seemed to be an old institution 12 years ago, when the writer first started to work in a foundry, molders may yet be found using vent rods from 3-16 to 3/8 inch diameter, with no other preparation than to grind the rod to a point at an angle of 20 or 25 degrees. Within the last few months I have seen a molder of 30 years' experience, and the star of the shop, using a 5-16 inch rod ground off a little at the end. He had to force it through 20 inches of hard rammed sand about 60 times a day every day for several weeks at the time, and I have often seen him stop and hold up his arm as if in pain, at the same time complaining how tired it made his arm. The casting was a thin one of peculiar shape, so the mold had to be rammed pretty solid and required an unusual amount of venting. It weighed about 90 pounds, and was poured with very hot metal from three hand ladles in two or

hree seconds, hence the necessity for quick action from the vents. Although our molder was exerting himself to force a 5-16 inch rod through 15 or 20 inches of sand, after using it for awhile the first few inches wore down so that ½ inch from the point it was not half that diameter, and the hole would not be full size until 2 or 3 inches from the point. It would not be exaggerating to say that with a properly made vent rod more certain results could be obtained with 1-10 of the exertion.

All vent rods from 3-16 inch up should have spear heads. Steel is preferable. Get a piece the right length and diameter, put it in a fire and bring about 1½ or 2 inches of one end to a forging heat. Cool off about ½ inch at the extreme end, secure it in a vise, allowing 1½ or 2 inches to extend out, and strike it with a hammer until you see it is large enough. Heat it again and forge it with the hammer on the anvil to the desired shape. A circle presents the smallest surface inclosing a given area, hence a head in the form of a cone would offer the least resistance to entering the sand, but is difficult to control and direct. The same objection applies in a less degree to the triangular head, a shape often seen in use.

Actual experience has demonstrated that for general utility the best shape is a four sided pyramid twice as long from base to vertex as the diameter of the rod. The length of each side of the base should be a shade more than the diameter of the rod to insure freedom from friction except on the head. Take a tempering heat on the head, plunge it into cold water, and the rod is made except the handle. The whole operation will not take more than 15 minutes. Medium sized vent rods that can be handled with one hand have woodeu knobs for handles. Larger ones requiring the use of both hands when used for straight venting have wooden haudles about the size and shape of old fashioned auger handles. All of the arguments in favor of metal handles for small vent wires apply with more force to large and medium size vent rods. For oue hand vent rods a very convenient shape is the sphere with the rod cast into it, patterns for any size being easily obtained. Another very convenient shape is that of the common door knob.

Heating and Ventilating the House Properly.

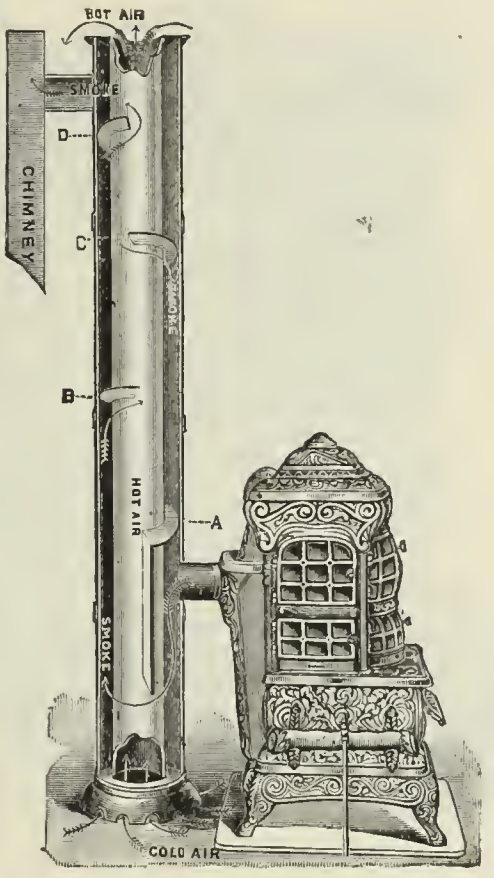
The proper heating and ventilation of the house, says a writer in a St. Paul paper, is one of the matters which at this season trequently comes up for discussion. One must have plenty of fresh, pure air to have good health, and this is what many women do not get through the winter, because they are shut up in houses not well ventilated. Few city houses are supplied with facilities for perfect ventilation. According to late day science on this question every room in every house should have a ventilator either at the ceiling or at the floor, or both. In a recent house where a good deal of attention has been given to the ventilation there is a small ventilator near the ceiling and one in the base board of each room. The latter is connected with a pipe which goes to the kitchen chimney. This method is considered a good one, because the heat of the chimney creates a continuous current, thus drawing out the stagnant air at the floor, and when the hot air register is open the ceiling one needs only to be slightly open to secure excellent ventilation.

City architects and builders do not as a rule give much thought to the matter, so that housewives who have studied the subject and learned the importance of a healthful home atmosphere find themselves confronted with several practical problems. In the first place, eveu in the newest houses the furnace draws its cold air supply from the cellar. This can be obviated by the building of a cold air box, which will not cost over $18 or $20. "But my cellar is clean, so what harm can there be even if the furnace is fed from the cellar air?" asks the housewife, who has given little heed to the matter. A cellar may be kept comparatively clean and yet the walls will get damp and moldy, as will all underground places. Of course the sanitary condition of the air in a perfectly clean cellar is much better than that in one where there are decaying vegetables and accumulations of rubbish, and yet the air feeding the furnace should come from outside, as a moldy condition of the cellar generates disease germs, and modern science shows that heat does not kill the most dangerous of these, but rather raises them to life to be thrown into the living rooms from the hot air registers.

"What simple precautions can be taken by the householder when no provision has been made for ventilation by means of modern facilities?" is the question which bears most directly on this matter every season when the fires are started. One of the simplest schemes yet devised is to raise the window and put in the open space a fitted strip of board, so that when the window is closed down upon it about 1 inch will be left open between the two sashes. The fitted board prevents a draft and yet affords an entrance for fresh air between the sashes. The only makeshift where even this simple arrangement is not provided is to lower the window slightly from the top. When heat is first turned into a cold room the windows should be lowered from the top to provide a circulation and to let out the cold, stagnant air, which otherwise has no escape, and against which the warm air makes slow headway.

The Waste Heat Radiator.

The waste heat radiator is a device of interest to the stove and furnace trade, which is manufactured and placed on the market by the Waste Heat Radiator Compauy, Buffalo, N. Y. The accompanying illustration shows it attached to a heating stove, but a similar application is made to a hot air furnace or to a steam or hot water boiler. In the latter cases the radiator is placed in the cellar, and the air is either taken from the cellar cold air box or through a pipe from an opening in the room above. After being heated it is taken from the top of the



The Waste Heat Radiator.

tube through a register into the same room, giving a circulation of air.

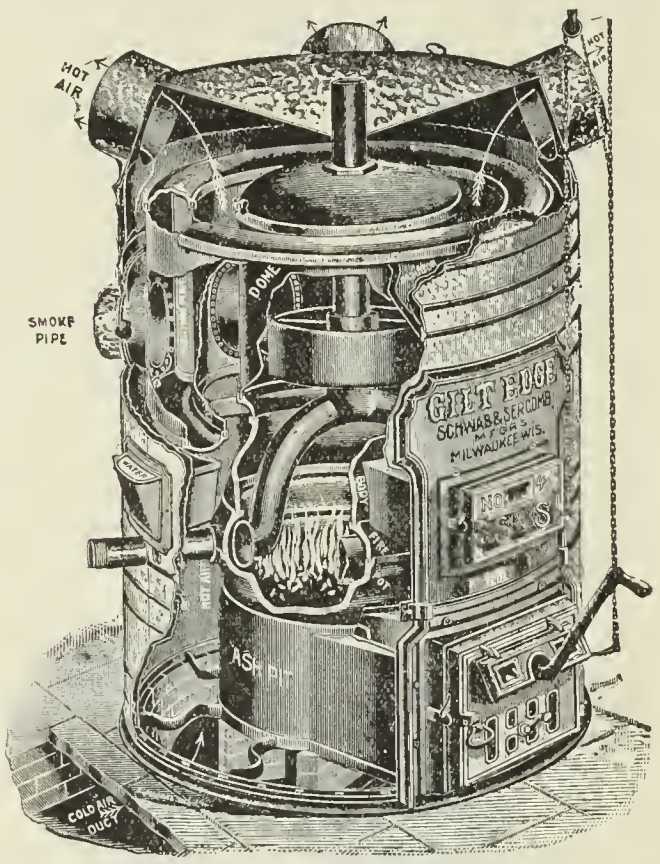
Referring to the illustration presented herewith, it will be seen that the device consists of a double cylinder supported from the floor by a perforated plate. The cool air is taken in as shown by the arrows at the bottom, passes through the central tube, and after being heated in its passage escapes into the upper part of the room. The pipe from the stove opens between the two cylinders, and the smoke rises in a spiral course around the inner tube, finally entering the chimney through the smoke pipe above, as shown. The smoke and hot gases are kept from escaping direct to the chimney by means of baffle plates, and by this means the heat is extracted from the products of combustion and prevented from wasting into the chimney. The manufacturers claim that by the use of this radiator a great saving of coal is effected. They also point out that it takes the cold air from the floor, and as the cold air is drawn in the hot air on the ceiling comes down to take its place, thus securing a continuous circulation of air in the room. The radiating surface of the radiator is given as about 40 square feet. The device is very readily attached to a stove and can, it is stated, be put in place in 15 minutes and while the fire is burning.

Joseph Huse & Son, 95 Blackstone street, Boston, Mass., are busy this season with the demand for Stove Re-

pairs and are also doing a good trade in Mica. Their 2-pound packages of eight sizes of Mica give a useful assortment in a convenient case which the trade will appreciate.

The Gilt Edge Combination Warm Air and Hot Water Heater.

In the accompanying illustration we show the new combination warm air and hot water heater manufactured under the name Gilt Edge by Schwab & Sercomb, Milwaukee, Wis., and E. E. Dunning, manager of their furnace department, says that he is particularly pleased with the favorable reception accorded this heater by the trade. As will be seen from the cut, the heater is provided with a deep ash pit, a labor saving grate and a space through which the fire may be readily cleaned. The fire pot is of the sectional type. The space of the upper section of the fire pot is utilized for a water heating ring, which is a hollow casting, high and narrow, containing the water in a thin sheet, which by the construction is made to circulate around its entire circumference, and as the ring extends outwardly it does not decrease the size of the fire pot. The water ring is incased in an iron casing made in two sections, with gas tight joints. There is a space between the water ring and this casing, so that all parts of the surface of the water ring are exposed to the action of the fire, and the water heater by this construction is not



The Gilt Edge Combination Warm Air and Hot Water Heater

exposed to the chilling effect of the cold air passing through the furnace to be heated. The water ring is tapped for a return at each side, the connections being made so as to secure a gas and dust tight joint. Pipes of large diameter are cast on the water heating ring at different places and extend upward in an arch shape to the center of the furnace, where the flow pipe connection carrying the hot water through the top of the heater is made. In case of increased heating capacity being necessary an additional section is connected to the water heater at the top of the arch. These sections consist of hollow rings which are thin and high, so as to present a large amount of fire surface and to make them as nearly self cleaning as possible. The furnaces are furnished with one flow pipe and two return pipe connections. The construction is such that the water on entering the lower water sections must travel horizontally for a considerable distance before it strikes one of the arching arms to pass upward, by this means insuring its contact with a considerable amount of fire surface and a thorough heating. The construction of the furnace is of a central dome type, with a smoke drum surrounding it so as to form two distinct air chambers in the furnace. One is centrally located, where its surfaces are affected by the direct radiation from the fire and the hot gases, and the other chamber is between the outer radiator and the casing of the furnace. The fire travel is governed by a damper and can be made direct or indirect, as desired. The furnace is provided with chain attachments for draft regulation. This heater, which is made in several sizes, is presented as first class in construction and efficiency, and correspondence is solicited in reference to it.

The Richmond Stove Company.

An exceedingly attractive stove catalogue of 64 pages, relating to their various lines of Richmond stoves, ranges and furnaces, has just been issued from the press by the Richmond Stove Company, with general offices and works at Norwich, Conn. The printing is in black upon calendared paper and the binding is in colored covers carrying upon the front in script type the word "Richmond." This appears diagonally on the page and is printed in deep red, the letters being bordered in black. The fourth page of the cover is embellished with a *fac-simile* of the company's trade-mark. In the line of ranges there are several additions to the company's assortment, Series 1, 2 and 3 being especially attractive in their external adornment. This line of Richmond ranges, it is said, represents the "fruit of years of earnest thought and practical experience." Reference is made to the complete appointments, durability, thorough workmanship and economy of operation of these goods, and special attention is called to the spacious oven, which is full size top and bottom; to the fire box of unusual capacity and to the powerful water front. In the oven door is placed a thermometer, which indicates accurately the temperature of the oven and which will be found a valuable aid in baking. The grate employed is the well-known Richmond, and the other features embodied are of a character to interest both the dealer and the consumer. The catalogue shows some of the many styles in which this range is offered, as well as many other patterns made under the same name. Among the heaters attention is first given to Series 312-316 of the Richmond surface burner, with cast flue box in the rear and with ascending and descending flues passing around the base. After this we find illustrations of Series 213-217 and Series 111-115 of the Richmond sheet iron surface burners. Richmond furnaces occupy the concluding pages, these consisting of Series 210-300 and Series 718 730 and Series 818-830. There is also shown the Richmond hot air and hot water combination heater.

The White-Warner Company,

Taunton, Mass., are enjoying an excellent demand for their Household ranges, are working full time and are not piling up stock. The prosperity of the concern is seen in the additions recently completed and in process of construction. The office building at one corner of the works, which has been finished but a short time, gives light and airy office quarters. They are now working on a sand house, have lately finished a pattern storage house and will shortly begin work on a further addition to meet the demand for space on account of the line of Household hot air furnaces which they have brought out this season, and which are meeting with favorable reception from the trade. In connection with this heater they are making a combination heater for hot water, using the Household with water sections around the fire pot, one or more according to the amount of water radiation demanded. H. A. Tinkham, who has had an extensive experience in furnace construction and selling, is now interested with the White-Warner Company as general manager and has brought his wide experience to bear in designing the Household heater, which has many features that will win the attention of the trade.

Tests of Coal.

The Marion Stove Company, Marion, Ind., issue a circular relating to the Special Retort Oak, a construction recently illustrated in the columns of *The Metal Worker*. In the circular they present a report of tests of different fuels made with this stove by Frank J. Gould. Sixteen tests were made in all, of six days each, covering a period from October 22, 1896, to February 22, 1897, the fuels used being hard coal, Jackson soft coal, Frick's 72-hour coke, Pittsburgh soft coal, green hickory wood, mixed Jackson and Pittsburgh soft coal, wet Illinois slack, Frick's coke and Pittsburgh coal, Pittsburgh coal and coke and Hocking coal. The tests were made in the office of the Marion Stove Company, a building 14 x 24 x 10 feet, containing 3360 cubic feet, the office being a detached building with five windows and one door. The stove used was a No. 16 Special Retort Oak, and fired so as to keep the inside air at a comfortable working temperature. We give below the result of the tests as summarized by Mr. Gould.

It will be seen that I used

534 pounds hard coal in 15 days, or 35 3-5 pounds per day, costing about 12 cents per day.

2034 pounds soft coal in 47 days, or 43¼ pounds per day, costing about 7 cents per day.

622 pounds Illinois slack in 16 days, or 38⅞ pounds per day, costing about 4 cents per day.

1365 pounds coke (Frick's 72-hour) in 37 days, or 36 8-9 pounds per day, costing about 8 cents per day.

435 pounds hickory wood in eight days, or 54⅜ pounds per day, costing about 6 cents per day.

In detail it will be seen that the hard coal covered but two tests with an average temperature of 40.5.

The soft coal covered seven tests with an average temperature of 34 4-7.

The Illinois slack covered two tests with an average temperature of 33 3-10.

The coke covered five tests with an average temperature of 28.

The wood covered one test with an average temperature of 40.2.

The above shows that while the hard coal used 35 3-5 ponnds per day it was done on the highest temperature, 40.5.

The soft coal shows 43¼ pounds on a temperature 34 4-7 degrees, but the soft coal extended over so much more time that it was affected more than any other fuel by the action of the wind. I discovered early that the wind pressure affected the consumption of fuels materially ; this was especially marked in the test of hickory wood, during the last three days of which the worst blizzard of the season raged. Taken as a whole, the tests show that there is little or no difference in any of the solid fnels, except in the price. If any one of the fuels has any advantage, Frick's 72-hour foundry coke has it, but this is a fuel difficult to manage by inexperienced persons and is used but little at present ; 48-hour crushed coke is easier managed and no doubt would be a desirable fuel.

THE STOVE TRADE IN CHICAGO.

The Chicago stove trade is reported steady on a moderate volume of businses Manufacturers are quite confident that the end of the season will find them with stocks pretty generally cleaned up. They began with small stocks in their warehouses. and the good movement in August pulled them down very sharply. If September and October had followed on the same lines, as was naturally expected, quite a scarcity would have developed by this time. But the abnormally warm weather caused a shrinkage in sales which leaves the supply of stoves in first hands fairly good. They are not excessive, however, because the demand was not cut off entirely as it was last year. Trade this year, instead of being adversely influenced by financial considerations, is regarded as being almost wholly under the influence of the weather. Phenomenally mild weather still prevails in the West and Northwest. Cold snaps have made their appearance from time to time in the past five or six weeks, but their duration was measured by hours rather than days as in every previous year for which records have been kept. This dependence on the weather causes stove men to hope that early in the present month a change may occur to something like sharp winter weather. But it must come soon to have a favorable effect on this season's trade.

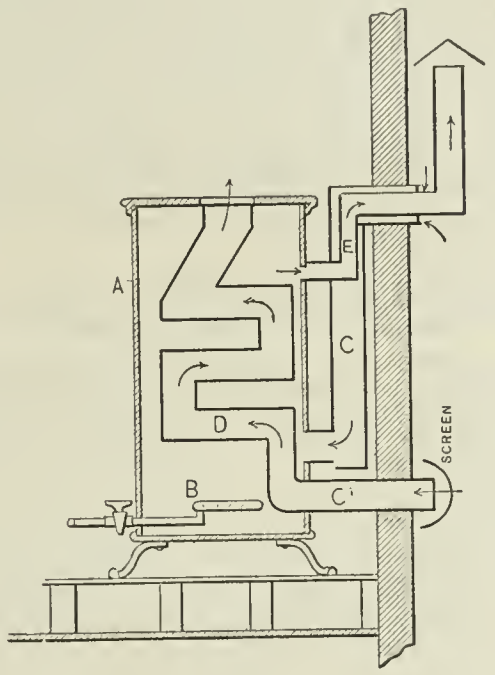
Hygienic Gas Stoves.

It will be admitted by every one, says a writer in *Ironmongery*, whether an expert in sanitary matters or not, that a gas stove, whatever its name or claims may be, cannot be considered hygienic if it does not fulfill the following conditions :

1. No fumes must be allowed to escape into the room.
2. An efficient escape pipe for such fumes must be provided.
3. In the case of sleeping rooms, air for maintaining combustion should not be taken from the room itself, but be admitted from the outside.
4. The warmed air should be also pure, and admitted freely from the open air, and passed over the heated surfaces, a constant circulation to be kept up by an independent outlet to open air or chimney with a good up-draft.

Such a stove, fitted to a bedroom or nursery, would be absolutely safe and healthy, as the condition of the air for the purpose of respiration is not deteriorated by previous use, and combustion is carried on independently. In many cases, however, all these conditions cannot be obtained except at great expense, and many sleeping rooms are so situated that direct communication with the open air is impossible, as in the case of basements underground, where thousands of sleeping apartments are to be found. In such cases a gas stove would be the worst form of heating arrangement, unless a chimney is available to carry off the products of combustion. There are many rooms, however, having no chimney, but so situated that access to the open air is available. In such cases a good gas stove is a safe means of obtaining comfort without the risk of endangering health.

To those in the ironmongery and kindred trades who are called upon to advise their clients in the matter of selection, I recommend an inspection of the room before advising, and next find a suitable stove. In this article, I wish to call attention to a type of stove that is, in my opinion, the best stove for a bedroom, as it fulfills all the conditions I have mentioned, and acts quite as well without a chimney to assist it. The cut shows in section all the essential details. A is a case of sheet metal entirely inclosing all the apparatus ; B is a gas burner of a few jets, either atmospheric or open burner ; C is a tube for conveying fresh air from outside the house to the gas burner, for the purpose of combustion only ; C^1 is a larger tube, which conveys air to the zigzag chamber D. The tube E is also carried to the open air, and either extended some length in a vertical direction, or fitted with a wind guard cap when it emerges from the wall ; this carries off the products of combustion. Its action is simple and is easily seen from the diagram. On lighting the gas, for which a small air tight door is provided, the zigzag tube becomes heated, the column of air inside at once commences to ascend, drawing in the fresh air through C^1; the pumping action increases till the tube acquires its normal temperature, regulated by the heat from the gas. A steady stream of fresh warmed air is sent into the room, without in any way extracting air from the room itself, and as this is discharged into the room at about the level of an ordinary bed the sleeper obtains it readily, and the only additional



Hygienic Gas Stoves.

apparatus necessary is a means of taking off the vitiated air, which may be done by a grating near the ceiling in the outer wall or into a passage.

ODD PLATES.

An oil painting was exhibited in the show window of the Ringen Stove Company's store in St. Louis, during fair week of this year, representing Vesta, the Goddess of Hearth, Household and Family, in the act of placing the laurel wreath of merit on the Quick Meal Gasoline Stove and the palm branch on the Quick Meal Steel Range, both of which are manufactured by the Ringen Stove Company. The picture measures 6 x 6 feet, and attracted marked attention during the time it was on exhibition; in fact, the company were so besieged with inquiries regarding it that they have had printed several thousand half-tone reproductions and are now sending them out to the trade. The picture is inclosed in a handsome gilt frame and occupies a conspicuous position in the store of the Ringen Stove Company, where it continues to attract a large number of visitors daily. At the display of the Ringen Stove in the Exposition Building, St. Louis, this company used an enlarged reproduction of this picture, measuring 30 feet square. This was placed at one end of the gallery, and by using a number of arc lights the picture was shown to great advantage to the vast throngs which visited the exposition in the evenings.

The Weir Stove Company, Taunton, Mass., are busily occupied in all departments. The company report an excellent demand for their Glenwood line of Stoves and Furnaces, and are at work on a Hot Water Heater, to the construction of which they are giving great care and are submitting it to thorough practical test before putting it on the market. The company pride themselves on the excellence of their foundry work and the fine results obtained are, in a measure, due to the extreme care taken in the inspection of castings, all plates having the slightest defects being thrown in the scrap heap. In fact, the majority of the plates discarded would seem perfect to the ordinary observer, and only a most scrupulous

inspection will discover the cause of their being thrown out.

The N. E. White Company, 21-25 Catherine street, Utica, N. Y., who were burned out September 28, state that they can promptly make shipments of Banner Stove Lining which they manufacture. In their advertisement this week they make the significant announcement that "you cannot burn out Banner Stove Lining," and they further give particulars of prices and quantities that will interest the trade. A number of extracts from testimonial letters tell what the users think of the Lining.

The G. S. Blodgett Company, Burlington, Vt., have recent shipped several of their Patent Portable Baking Ovens to Cairo, Egypt, for use on the Nile steamers. This is the second order from this place, a former lot having been in use a year and proved well suited to the work.

Schill Brothers, manufacturers of Furnaces and Steel Ranges, Crestline, Ohio, report that business with them was never so good as at present; in fact, they are snowed under with orders and scarcely know how to keep up.

The Henry N. Clark Company, 103-105 Blackstone street, Boston, Mass., have done and are doing a most satisfactory business in the Novelty Blue Flame Oil Stove made by the Novelty Mfg. Company, Jackson, Mich., for whom they are the New England agents. Their trade this year has been so large that they have been compelled to increase their orders from the manufacturers to meet the growing demand. Messrs. Clark Company, who for some years have had only a part of the Eastern district, are now agents for the entire New England territory, and besides the Blue Flame Oil Stoves are agents for the Aluminum Oil Stoves and the whole extensive line of goods made by the Novelty Mfg. Company.

M. Gensmer & Son, Caledonia, Minn., have the contract for heating the store of Tuos & Co. and F. Collins & Co., using No. 16 Brand's Famous Magnet Furnaces.

The Smokeless Fuel Saving Stove Company of New York City have been incorporated; capital, $100,000; directors, William D. Goodwin, H. L. Bridges, W. W. Gage, Herman Schmidt, Frederick Girtanner, Morris Sternfield and Samuel D. Sewards.

The Rutland Fire Clay Company of Rutland, Vt., have issued a price-list which they request the recipient to preserve for future reference. The prices cover Rutland Stove Linings, Stove Polish, Vermont Polishing Mittens and Black Imp Dealers' Polish. The company are also sending out cards calling attention to their Stove Lining, which they state is the result of 15 years' experience and careful attention to what constitutes the requirements of a good plastic Stove Lining.

A. Weiskittel & Son, Baltimore, Md., have issued a supplementary catalogue, setting forth the merits of the Patapsco Ranges, which they state have been greatly improved in every way. The Patapsco is a richly decorated Stove with large six-hole top, swell oven door, extra heavy double covers and all parts reinforced in such a way as to render them very durable. The interior construction remains practically the same as heretofore, but the Range has a new dress in which rich carving constitutes an important factor. The Range is made in three sizes and several modifications. In connection with the Range are shown engravings of a fancy high shelf and high closet, also of the No. 10 Fire King Oil Heater. A few testimonials are given bearing witness to the favor in which the Patapsco Range is held by the trade.

Janes & Kirtland, 110-116 Beekman street, New York City, have added to their line a new Beebe Range, which is adapted to the requirements of the modern builder. They are made with ovens of different sizes and with different sizes of cooking holes on the top. They are furnished with feet, with a hot closet, with warming shelf, and with a water back for vertical boiler or with brackets for supporting a horizontal boiler either exposed or incased. Circulars giving prices and cuts of the Range can be secured on application. They have also added to their Beebe line of Furnaces a series of Furnaces with steel radiators, which include two small sizes with 28 and 32 inch casings and run up to the large sizes, the largest of which has a 52-inch casing, the smallest sized fire pot being 16 inches in diameter. Their circulars show the Furnace with a labor saving grate and a dust flue for carrying off fine ashes. The circular also gives various dimensions and prices of the Furnaces.

John P. Ley, manager of the New York house of Charles Noble & Co., Philadelphia, has arranged his show window at 239 Water street very attractively. Their Home Liberty, a Range for builders, with horizontal boiler, occupies one side and a Sam Fire Place Heater the other. Placed so as not to obscure these are a Liberty Oak, two Game Oil Stoves and a Liberty Square Parlor Heater. The Oil Stoves have a large illumination, and when lighted in the late afternoon produce a fine effect that can be imitated by the Stove dealer with benefit.

The Bonnet-Nance Stove Company, Quincy, Ill., have issued the following notice to the trade under date of October 29: "We regret to inform our customers and friends that a large portion of our works was destroyed by fire on the night of the 27th inst., and, while it is our intention to rebuild and get under way again as soon as possible, that there will be a delay of perhaps 60 days before we will be able to fill orders." The local papers state that the loss is $100,000 and insurance $60,000. The works were running full force, with numerous orders to fill, and a stock of about 8000 Stoves in the warehouse, which were broken or partly melted and thus damaged beyond hope of salvage The company have the sympathy of the trade in their misfortune. They have been long established in the Western Stove trade and are as highly regarded as they are well known.

The Michigan Stove Company are aggressive in their position against department stores. They are distributing throughout the trade one of their boiler plate postal cards, this time of a deep blue color, which attacks department stores, defends the retail merchants who confine themselves to one legitimate line of goods and suggests how retail merchants can effectively look after their own interests. In this line of thought the natural conclusion presented is that retail merchants should give their encouragement and co-operation to those manufacturers who have persistently refused to sell to department stores.

The M. & D. Range Company, 7700 to 7740 South Chicago avenue, Chicago, have enjoyed a specially good demand this season for their combination Gas and Coal Range. A Range of this character supplies a want in a dwelling house which the housekeeper desires well furnished and is therefore not disposed to stint the investment in the kitchen. The managers of the company have been very greatly pleased with their trade in this specialty, which does not seek favor through its low price. The business thus done is an indication of a better feeling among the people generally, of more remunerative employment and of a much easier financial condition. The demand for other high class cooking goods has also been considerably better than last year, although the company's facilities would enable them to easily handle a larger trade. They manufacture nothing but cooking goods, aiming to make their mark in this line alone.

Fletcher, Russell & Co., Limited, of Warrington, England, send us a copy of the first and second sections of their catalogue covering cooking and heating appliances for using gas as a fuel. Accompanying the catalogue is a little pamphlet illustrating the company's New Fireglow Stoves, which are referred to as "unique in design and attractive in appearance." They are something on the order of an open Franklin, although the designs vary to meet different requirements. When the Stoves are in use they present the appearance of a brilliant incandescent fire, although the manufacturers state that this effect is not produced by the use of colored glass, but by an arrangement which is fully patented The claim is made that the Stoves are well adapted for shops, entrance halls, &c., where it is difficult to use an open fire satisfactorily. Nearly all patterns made with flues, it is stated, can be adapted to the patent Fireglow arrangement if the flue is left open to the room. Like all other flueless Stoves, however, the manufacturers do not recommend this arrangement for badly ventilated rooms with low ceilings, or for small sitting rooms, as the absence of a flue produces a close feeling in small rooms whatever make of Stove is used. Neither are they recommended for school rooms, where "free circulation is of more importance than warmth," but rather for lofty reception rooms, restaurants, offices, &c. The Stoves are offered under such names as the Congo Fireglow, the Hall Fireglow, Oval Fireglow, Ruby Square, Tubular Fireglow and Brazier Fireglow.

"Artistic Furnishings for Fire Places in Brass, Wrought Iron and Cast Iron" is the title of a very attractive pamphlet which is being distributed among the trade by the S M. Howes Company, 40-46 Union street, Boston, Mass. The goods shown include Portable Basket Grates on casters, with dump centers; Portable Chair Grates; brass, wrought iron and cast Andirons; brass Fire Sets, cast Fire Sets, brass Fenders, Coal Hods, Folding Screens, Spark Guards, Bellows, Gas Logs, Ash Pit Doors, Boiler Doors, Boiler Grates and Fire Place Dampers. The pamphlet is printed on a good quality of paper and is bound in colored paper covers, with a red silken cord tied through the upper rear corner for the purpose of hanging the publication within convenient reach for reference.

Southard, Robertson & Co., 23 Peck slip, New York, have much to interest the Stove dealer in their sample room. The goods that are moving liveliest at present are the new Magnetic X Ray and the Savoy Ranges. For the winter trade their Flag Cylinder Stoves and Columbus Square Parlor Heaters have many attractions. The Madison Square and the Plaza are more handsome and qualified for leaders where high grade goods are desired.

TRADE REPORT.

METAL MARKET.

Pig Tin.—There has been about the usual distribution of Pig Tin, chiefly against current wants, but large deals were quite the exception. Wholesale prices have ruled fairly firm, however, while jobbers' prices are unchanged. Small lots of Straits Pig from store are generally quoted at 14¾c. per lb.

Copper.—The market has remained in somewhat dull condition and the undertone is somewhat weak, particularly for Lake Superior Ingot. The demand for all varieties is slow and values in the wholesale market seem to be irregular. Retail business has been of moderate proportions. In small parcels from store Lake Ingot is quoted at 12c. to 12¼c. per lb. and Ansonia Grade Casting Copper at 11c. to 11¼c.

Sheet Copper.—There is no change in the condition of this material from that reported for the past few weeks. The demand is irregular and orders received are mainly for current requirements. The volume of business is little if any better than last season. Manufacturers, however, look for improvement, both in the amount of business and in values, after the turn of the year. At the present time the usual quotation for moderate sized lots of Sheet Copper from stock is about 15c. per lb., basis.

Pig Lead.—Comparatively little business has been effected during the week, but the market showed rather firmer tone, and offerings were more reserved than for the past few weeks. Jobbers' prices are unchanged, small lots of American Pig being quoted at 4.35c. to 4½c. per lb.

St. Louis advices are as follows : The market for Pig Lead is a waiting one, both buyers and sellers appearing uncertain what move to make. The situation is a trifle mixed, although with light stocks in the hands of both producers and consumers the chance for an early advance seems favorable.

Lead Pipe and Sheet.—Nothing but the most ordinary type of demand is noted. Consumers are taking merely enough material to supply their current needs and these are of a limited character. The recent reduction in prices of Pipe and Sheet does not seem to have led to any expansion of orders. Eastern manufacturers and dealers quote Lead Pipe at 6c. and Sheet at 7c. per lb., subject to the customary discount.

Spelter.—The market has remained very quiet and there is no feature of interest aside from the general report that prices are fairly well maintained despite the dull condition of the market. The consumptive demand remains very moderate and retail prices show no variation. Small lots of good Western brands are quoted here at 4.65c. to 4¾c. per lb.

St. Louis advices are as follows : There is absolutely no change to note in this metal. The prediction made in this report several weeks since that 4.10c. would be maintained during the balance of the year seems in a fair way to be verified. Producers claim they are satisfied with this price, as it enables them to manufacture with a fair margin of profit, and consumers prefer a steady price to an up and down market, so that there appears to be general satisfaction all around. The demand is not heavy, but there is no accumulation of stock in either producers' or consumers' hands.

Sheet Zinc.—The consumptive demand is of the ordinary routine nature which has characterized this material for many months past. Prices are unchanged. Jobbers quote 600 lb. cask lots at 5⅝c. to 5¾c. per lb. and smaller quantities at 6⅛c. to 6¼c.

Antimony.—A very fair distribution has been going on in a jobbing way and prices remain steady on the basis of 8¼c. to 8½c. for Cookson's, 7¾c. for Hallett's and 7⅛c. to 7¼c. for Japanese in retail quantities.

Nickel.—Sellers are quoting 36c. to 38c. for small quantities.

Aluminum.—A fairly large volume of orders is reported for this metal in its various forms. Present prices are as follows : No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb., 100 lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb., 100 lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb., 100 lb. lots, 30c.

Tin Plate.—There is little of interest to note in connection with this market. While a few good sized orders for American Cokes for extended deliveries are understood to have been placed with the mills during the week, the general run of business has been very quiet and prices remain without important change. The delay in deliveries by the mills is still an important feature of the situation. Spot stocks are admittedly small, and available Plates are readily absorbed, notwithstanding the somewhat limited demand. These factors, which are likely to remain as such for the balance of the year, tend to stiffen the dull market. Makers are offering freely for distant future shipments, but most of the mills are believed to be well booked up for the next three or four months. Quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows : American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60 ; do., 100 lbs., $3.40 to $3.50 ; do , 95 lbs., $3.35 to $3.45 ; do., 90 lbs., $3.30 to $3.40 ; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75 ; Allaway grade, IC, 14 x 20, $4.25 ; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates remain very quiet and prices are largely nominal.

Chicago advices are as follows : The Tin Plate market is quiet, with some inquiries for next year. Manufacturers state that domestic makes now control the Pacific Coast trade with the mere exception of Tin Plates intended for export packages.

A special London cable dispatch of November 3, 1897, reports on the British Tin Plate market as follows : Tin Plate steady for prompt delivery and more active for forward, but large business possible only at lower prices. Several works shut down owing to a portion of workmen refusing to accept the lower wages scale. Stocks at Swansea docks have increased to 134,000 boxes.

Sheet Iron.—The demand for thin Sheets continues active, but there is still considerable difficulty in getting prompt shipments. Mills which are able to make quick deliveries are asking and getting the outside prices. A number of consumers have come into the market recently for additional supplies, and the movement of both Black and Galvanized Sheets is quite heavy all told. While mills are generally holding to the prices recently agreed upon, some jobbers are quoting below them. Jobbers' prices in this section for small quantities are quoted at 2.35c. to 2.40c. per lb. for No. 27 Common Black Iron and 75 and 10 and 5 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows : Almost all the mills are far behind in deliveries on Black Sheets. Colder weather in the Northwest is causing urgent appeals for prompt shipment. All manufacturers are taking larger quantities than had at first been estimated. The situation is not so good, however, on Galvanized Sheets. Small lots from stock are selling at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—A fairly good local business is being done in all lines of Scrap metals The demand for Old Brass and Copper for export has been rather heavy and has tended to keep up prices for those materials. Scrap Brass is about ½c. per lb. higher. Large shipments were made during the week to Liverpool, England, and Genoa, Italy. Scrap Zinc is also in good demand abroad. The demand for Scrap Iron is somewhat irregular, but prices remain firm, as a whole. Dealers in this city and vicinity pay about the following rates for moderate sized lots, delivered here :

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3 c.
Zinc	per lb. 2½c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10.50
Heavy Cast Scrap, per gross ton	9.50
Stove Plate Scrap, per gross ton	5.50
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	5.00

THE IRON MARKET.

While the furnaces and rolling mills in the leading producing sections are still crowded with work, and are even finding prompt delivery a troublesome matter, it is a fact that many producers are beginning to show some concern as to future employment. The confidence in a prosperous year for 1898 has not abated, but the usual winter interregnum of a slackening demand is the *bête noire*. Sellers are a shade more eager, while buyers show a little more disposition to await developments. As a matter of fact, both are maneuvering for position for next year, with the chances somewhat in favor of the latter, so far as the first quarter is concerned.

As representing the consumptive demand, the volume of business in Finished Iron and Steel continues good. While Bars in the Valleys remain steady, with a large tonnage booked, works further West are not quite so well off.

The market for Southern Pig Iron is a shade easier. Much has been made of the sales of warrants at concessions. As a matter of fact, warrants must naturally sell 35c. to 50c. below the market for Pig Iron, first because warrants must be paid for spot cash, even though it takes several weeks to obtain the actual Iron. Then the warrants call for 2240 pounds and not for 2268 pounds, which is the usual Southern shipping weight.

Pig Iron.—In the New York market, the demand has been light and some indications of shading in prices are developing. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $11 to $11.25; No. 2, $10.50 to $10.75; No. 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

The Philadelphia Pig Iron market is a little quiet and intimations are given in some quarters that prices are not so well sustained as they were during the earlier portion of last month. Leading concerns do not attach much importance to these statements, however, as they all agree in saying that deliveries are well taken and that scarcity is more frequently met with than oversupplies. Sales during the past week have been chiefly in small lots at quoted rates, large orders being held in abeyance pending further developments as to general conditions. General quotations for seaboard deliveries are about as follows, with the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.50; No. 2 X Foundry, $11.25 to $11.75; No. 2 Plain, $10.75 to $11.

Local Pig Iron producers in the Chicago district report a moderate business, which, however, includes a few good orders. Inquiries are not so numerous as they were, and producers would not be disappointed if new business for the remainder of the year should prove light. Shipments are very heavy on old contracts, Iron going out from furnaces about as fast as it is made. Southern sales agents report a very light trade with few inquiries. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

In Pittsburgh, the week has been an active one in sales of Pig Iron, close to 75,000 tons of Bessemer having changed hands. These heavy sales, however, have not strengthened prices, which are only fairly strong. Foundry Irons are very dull in the Pittsburgh district, but are reported to be in better demand elsewhere. For balance of the year delivery we quote as follows, f.o.b. Pittsburgh: No. 1 Foundry, $11 to $11.25; No. 2, $10.50 to $10.75; No. 3, $10 to $10.25; Bessemer, $10.30 to $10.40.

There has been little change in the Cincinnati Pig Iron market While the tonnage of Southern brands sold by the furnaces has been small and confined in the main to small lots, there has been fair sprinkling of warrant Iron disposed of. The amount of this speculative stock, while not seriously heavy, is just enough to cause what irregularity is in sight, as it is being quoted pretty generally at 50c. or more less than maximum furnace askings. The furnaces themselves are very firm in their stand and not many of them are willing to entertain propositions for any less than maximum quotations. But little Iron is being sold; deliveries are heavy and not up to the demand. Production is not expanding, either in the South or the North. These factors are causing some agents to expect another heavy buying movement before January 1. The general outlook is regarded as excellent. Prices, in the absence of an active inquiry, may be regarded as unchanged. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

In St. Louis the demand is only fair and consumers have nearly all supplied their immediate requirements and are not in the market to replenish their stocks at this time. Furnace agents are refusing to shade prices, and the fact that the furnaces as a rule are well supplied with orders makes them particularly independent in this direction. The trade during the balance of the year, it is thought, is not likely to be heavy, as consumers will allow their stocks to run down until after the annual inventories are taken. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.50 to $11.00
Southern, No. 2 Foundry	10.25 to 10.50
Southern, No. 3 Foundry	10.00 to 10.25
No. 1 Soft	10.25 to 10.50
No. 2 Soft	10.00 to 10.25

CHICAGO REPORT.

Scrap.—The movement continues fair, but the demand is not quite so active as last week. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c.	2.50	....
Old Boilers—whole (Iron)	4.00	....
Old Boilers (Iron)—cut in single Sheets and Rings	7.00	....
Old Gas Pipe and Boiler Tubes	6.00	....
Cast Borings	3.50	....
Turnings	4.50	....
Horseshoes	9.50	....
Copper Wire and Heavy	....	10 c.
Copper Bottoms	....	9 c.
Copper Clips	....	9¾c.
Red Brass	....	7¼c.
Yellow Brass	....	6½c.
Light Brass	....	4 c.
Pipe Lead	....	3.60c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3⅛c.
Rubber Hose	....	¾c.

Anthracite.—Coal merchants are disappointed this season. Cold snaps only last a few hours. Mild weather is the rule. Consequently coal is in very light demand. Prices are weak. The card on carload lots of 12 tons minimum is now as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo.	7.50
All points between Denver and Missouri River	7.00

The Bethlehem Iron Company, South Bethlehem, Pa., shipped last week to Newport News, Va., ten side armor plates, weighing 276 tons, for use on the new battle ship "Kentucky."

Corporation Counsel Thornton of Chicago, backed by Mayor Harrison of that city, has begun in the courts a fight on the department stores under the provision of city ordinances recently passed.

THE HARDWARE TRADE.

The business of October was somewhat disappointing, there not having been the increase in volume which was expected. The aggregate is, however, referred to as having been on the whole fairly satisfactory. The trade had, apparently, covered their immediate wants by their earlier orders, and were waiting to work off goods on hand before making further purchases. The condition of things in the South has interfered to a considerable extent with business in that section. The coming of cold weather will undoubtedly have a beneficial effect, and will stimulate in all parts of the country the demand for winter goods. There are few changes in price to note. The high prices developed for Wire Nails under the very active demand which has until recently prevailed show indications of a slight weakening, but in most other lines prices are steadily maintained, and the tone of the market is about as it has been. Some leading goods continue very low under stress of competition and as a result of the fact that the capacity of the mills for producing them is largely in excess of the demand for consumption. A very encouraging feature of the situation is the large amount of goods going abroad, the number and kind constantly increasing. Manufacturers are recognizing more and more the importance of this class of trade, which not only furnishes an outlet for goods which cannot be readily taken up in the home market, but opens wide and promising fields for permanent occupation in which a great amount of goods may be regularly disposed of.

Advices from Chicago.—The volume of business in Shelf Hardware is about the same as in the last half of October. The falling off since high tide in September has not been continuous, and the present even character of business is expected to continue until well toward the end of the year. It may be modified by occasional spurts in the demand for seasonable goods as cold snaps develop. The snow and cold weather in the Northwest have even now produced a noticeable effect in some lines, and especially in the demand for Black Sheets for Stove Pipe as well as Stove Trimmings. The present rate of business is very much better than in the corresponding period of last year, and it is believed that, taking the very low price of goods now prevailing, the movement will compare very favorably with the best years in the past. Tinware jobbers report quite a good movement in some classes of their specialties, but the general demand is lighter than it has been, while the movement in Metals is very considerably smaller. Heavy Hardware jobbers report a very good trade in Iron, Steel, and Wagon and Carriage Stock.

Advices from St. Louis—The Hardware jobbing trade are feeling the effects of the changed condition of the weather. On the 30th ult. the entire West and Southwest was treated to a most liberal rain, followed by cold weather. Thus in one stroke the two impediments to trade, the drought and the yellow fever scare, were practically removed. The demand for cold weather goods is remarkably active and bids fair to continue for the balance of the year. Reports from traveling men are extremely promising, and as they are usually accompanied with liberal orders more attention is given them than if no orders followed. The territory tributary to this market is in better condition than it has been for years past. Money is plentiful, and those that have it seem willing to spend it, so that reports of increasing trade from all parts of the West and Southwest are now becoming quite common. The advances which have already been made are being well maintained, and as there appears to be no disposition to crowd prices upward the general situation is very healthy. Collections are excellent, many dealers discounting bills who heretofore took the usual 60 days.

NOTES ON PRICES.

Wire Nails.—Something of a falling off is noticeable in the demand for Wire Nails, but most of the manufacturers are still well occupied. Some of them, indeed, are behind their orders, but as a general rule it is not difficult to obtain prompt shipments. The market is not quite so strong in tone. New York quotations for small lots from store are $1.65 to $1.70.

Advices from Chicago.—Manufacturers report only a moderate demand, with the exception of Kansas and Nebraska trade, which is quite heavy owing to low freight rates. They look for a large business with Colorado points as soon as freight rates are believed to be at bottom. The advancing tendency of prices has stopped, but factories are quite firm. Jobbers quote small lots from stock at $1.55 to $1.60.

Advices from St. Louis.—There is no change to note in Wire Nails. The demand is quiet, which is not unexpected at this season of the year. Prices are well maintained, however, and both manufacturers and jobbers are getting full prices. Jobbers ask $1.65 to $1.70, base, for small lots from store.

Cut Nails.—The market at present is an open one. The New York price for small lots from store is $1.43, this figure being sometimes slightly shaded. The demand is referred to as fair but not heavy.

Advices from Chicago.—A steady but small business is in progress in Cut Nails, in which the trade is now centered in very few hands in this locality. Small lots are quoted at $1.50.

Advices from St. Louis.—There is no change to note in Cut Nails. Jobbers are asking $1.45, base, for small lots from store.

Barb Wire.—The Barb Wire market is steady, with a moderate volume of business. Quotations are unchanged.

Advices from Chicago.—Manufacturers report a good movement to some localities which are favored by reduced freight rates, but the demand from other sections is quiet at present, as usual at this time of the year. Factories are still busy on contracts and have not yet begun to pile up stock. Small lots from stock are quoted at $1.60 for Painted and $1.90 for Galvanized.

Advices from St. Louis.—Mills report a fair demand only for Barb Wire, but prices are firmly maintained. Jobbers' sales are light and prices quoted are $1.65 for Painted and $1.95 for Galvanized.

Wrought Iron Pipe.—The market on Wrought Iron Pipe is very firm and the arrangement recently adopted by the manufacturers in regard to deliveries on carload lots and no deliveries on less than carload lots is referred to as working satisfactorily.

Carriage Bolts, Machine Bolts, &c.—There is little change to note in this line of goods since our last report. The manufacturers appear to be succeeding quite well in maintaining the slight advance decided upon at their recent conference. The jobbers, however, are still cutting prices pretty freely, thus working off some of the stock which they accumulated at the lower prices which resulted after the breaking up of the combination.

Steel Clad Bathtubs.—Under date of October 20, 1897, the manufacturers of Steel Clad Bathtubs and All Steel Enameled Tubs have issued the following standard price-list on these articles, superseding all other lists:

Standard List Steel Clad Copper Lined Baths.

This list applies to all Tubs made with a steel outer casing with tinned and planished copper lining.

AMERICAN PATTERN—SHALLOW.

Standard Tub. Sometimes called No. 2.

Common Overflow.

Size	Weight, Copper Lining, 12 ounces.	14 ounces.	16 ounces.
4 feet 6 inches	$23.00	$25.00	$27.00
5 "	24.00	26.00	28.00
5 " 6 inches	25 00	27.00	29.00
6 "	27.00	29.00	31.00

Connected Waste and Overflow.

Size	Weight, Copper Lining, 12 ounces.	14 ounces.	16 ounces.
4 feet 6 inches	$24.50	$26 50	$28.50
5 "	25.50	27.50	29.50
5 " 6 inches	26.50	28 50	30.50
6 "	28.50	30.50	32.50

ROMAN PATTERN—SHALLOW.

Common Overflow.

Size	Weight, Copper Lining, 12 ounces.	14 ounces.	16 ounces.
4 feet	$26.00	$28.00	$30.00
4 " 6 inches	28.00	30.00	32.00
5 "	30.00	32.00	34.00

Connected Waste and Overflow.

Size	Weight, Copper Lining, 12 ounces.	14 ounces.	16 ounces.
4 feet	$27.50	$29.50	$31.50
4 " 6 inches	29.50	31.50	33.50
5 "	31.50	33.50	35.50

FRENCH PATTERN—DEEP.

Sometimes called No. 1.

Common Overflow.

Size	Weight, Copper Lining, 12 ounces.	14 ounces.	16 ounces.
4 feet 6 inches	$30.00	$31.00	$33.00
5 " 3 "	31.00	33.00	35.00
5 " 9 "	31.50	33.50	35.50
6 "	33.00	35.00	37.00

Connected Waste and Overflow.

Size	Weight, Copper Lining, 12 ounces.	14 ounces.	16 ounces.
4 feet 6 inches	$31.50	$32.50	$34.50
5 " 3 "	32 50	34.50	36.50
5 " 9 "	33.00	35.00	37.00
6 "	34.50	36.50	38.50

ROMAN PATTERN—DEEP.

Common Overflow.

Size	Weight, Copper Lining, 12 ounces.	14 ounces.	16 ounces.
4 feet	$29.50	$31.50	$33.50
4 " 6 inches	31.50	33.50	35.50
5 "	33.50	35.50	37.50

Connected Waste and Overflow.

Weight, Copper Lining, 12 ounces.	14 ounces.	16 ounces.
Size, 4 feet..... $31.00	$33.00	$35.00
" 4 " 6 inches..... .. 33.00	35.00	37.00
" 5 " 35.00	37.00	39.00

All Steel Enameled Tubs.

This list applies to all Tubs made of sheet steel and painted or enameled on the interior.

AMERICAN PATTERN—SHALLOW.

Standard Tub.

Common Overflow.

Size, 4 feet 6 inches.	$18.00
" 5 "	19.00
" 5 " 6 inches.....	20.00
" 6 "	23.00

Connected Waste and Overflow.

Size, 4 feet 6 inches.....	$19.50
" 5 "	20.50
" 5 " 6 inches	21.50
" 6 "	24.50

ROMAN PATTERN—SHALLOW.

Common Overflow.

Size, 4 feet.....	$21.00
" 4 " 6 inches.....	22.00
" 5 "	23.00

Connected Waste and Overflow.

Size, 4 feet.....	$22.50
" 4 " 6 inches.....	23.50
" 5 "	24.50

Glass.—Nothing of especial interest has taken place in the Glass situation during the past week. There are no indications of an immediate start of the factories, while it is certain that Glass will become scarcer as cold weather approaches. A Board of Directors has been elected by the members of the American Glass Company, but the sales agent has not yet been appointed. New York quotations continue to be 60 and 10 and 5 on American Glass, and 80 and 20 per cent. on imported. Chicago jobbers' price for American Glass on the first of the month was 60 and 10 per cent. discount, except for 16 x 20 single strength, this size being 60 per cent. discount. It is anticipated that about November 10 a further advance of 5 and perhaps 10 per cent. will be made.

White Lead.—There has been scarcely any variation in the market. Consumers' purchases were commonplace and merely fair in amount, while dealings all through were at unchanged prices. There is nothing distinctly new in the condition of the market for crude material or in the outside influences otherwise.

Red Lead.—There has been a rather slow market, but sellers quite generally hold to former prices, with more or less showing of firmness.

Spirits Turpentine.—Prices have weakened off to about 33 to 33½ cents for retail quantities, and merely fair business has been done at the decline.

Old Rags, Paper, &c.—A good demand is noted in nearly all lines of Paper Stock. Prices are firmly held. Dealers are paying about the following rates for New York City delivery :

No. 1 White Rags.....per lb.	2⅝ to 2¾c.
No. 2 White Rags.....per lb.	1¾ to 1⅝c.
Mixed Rags.....per lb.	1 c.
Blues and 3ds.....per lb.	1 c.
Hard Sized White Shaving.....per lb.	1¾ to 2 c.
No. 1 White Book Shavings.....per lb.	1½c.
No. 2 White Book Shavings.....per lb.	¾ to 1 c.
Light Book Shavings .....per lb.	½ to ¾c.
No. 1 Mixed Shavings.....per lb.	¾ to ⅞c.
No. 2 Mixed Shavings .....per lb.	½ to ⅝c.
No. 1 Printed Books.....per lb.	⅞ to 1 c.
Ordinary Mixed Books.....per lb.	½c.
Newspapers .....per lb.	½ to 9/16c.
No. 1 Manila Paper.....per lb.	⅝ to ¾c.
No. 2 Manila Paper.....per lb.	⅜ to ½c.
Bogus Paper .....per lb.	⅜c.
Common Paper.....per lb.	¼ to 9/10c.
Straw Chips.....per lb.	⅜c.
Binders' Clippings.....per lb.	½c.
Jute Butts.....per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging.....per lb.	¾ to 1 c.
Mixed Bagging.....per lb.	½ to ¾c.
No. 2 Bagging.....per lb.	½ to ¾c.
Hemp Twine.....per lb.	1⅜ to 1¾c.
Manila Rope..... per lb.	1¾ to 2 c.
Jute Rope.....per lb.	1½ to 1⅝c.
Mixed Rope.....per lb.	¾ to ⅞c.

Old Rubber.—The demand continues active and prices are firm. Local dealers are paying about the following figures :

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb.....	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb..... ...	4 c.
White Syringes, per lb.....	4 c.

The Chicago schooner " F. W. Gifford," laden with a heavy cargo of iron ore, sprung a leak on Lake Michigan last week and sank to the bottom. It is problematical whether the cargo can be recovered.

The increasing demand for platinum has caused a sharp advance in the price of the metal Preparations are being made for developing more extensively the platinum mines in the Ural Mountains, so as to increase the output.

Charles Parsons, inventor of the steam turbine which fitted in the 100-foot torpedo boat " Turbinia" gave her a speed of 33 knots an hour, is about to construct at New-Castle-on-Tyne, England, a vessel of the torpedo boat destroyer type with turbine engines which it is calculated will attain a speed of from 36 to 40 knots an hour.

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Metal and Miscellaneous Prices

CHICAGO, NOVEMBER 4, 1897.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
C, 14 x 28		$7.25
X, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
X, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
X, 14 x 56	21.00	$12.50
XX, 14 x 56	24.00	14.00
X, 14 x 60	23.00	13.50
XX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double th price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 20½	8.50
	IC, 20 x 32½	0.50
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔.....15¢
95 ℔.....20¢
90 ℔.....25¢
85 ℔.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
S T P / L Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16 ℔	1.90¢	2.50¢
17 to 20 ℔	2 00¢	2.60¢
21 to 24 ℔	2.10¢	2.70¢
25 an 26 ℔	2.20¢	2.80¢
27 ℔	2.30¢	2.90¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ℔, A....$10.20 / 10% dis.
Patent Planished, ℔, B..... 9.20 / dis.
Craig's Polished Sheet Steel.....8½¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake..... 11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch ..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Slab Spelter—

Western Spelter.....4¼@4¾¢

Sheet Zinc—

600-℔ casks.....5¾¢
300-℔ casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized .....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Cutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin.... ℔ square,	$4.75	$4.50
Galv..... ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.. .....8 @ 12¢
Iron Paint, Bright Red.....℔ 2 ¢
" " Brown.. .....℔ 1½¢
" " Purple .....℔ 2½¢
" " Ground in oil, B. Red, ℔ 6½¢
" " Ground in oil, Red. .℔ 6½¢
" " Ground in oil, Brown, ℔ 5½¢
" " Ground in oil, Purple, ℔ 6½¢
Linseed Oil, Boiled, in bbls.....37¢
Linseed Oil, Raw, in bbls.....35¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... 12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal....35¢
Asphaltum, Trinidad Refined, ℔ ton, $45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet..... $1.25
Roofing Pitch, ℔ bbl. of 300 ℔... $3.00

NEW YORK, NOVEMBER 5.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge. In lots of 50 lbs or more.

	6-in.	14-in.	24-in.
Wider than.....	14-in	24-in.	30-in.
And including.....	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8¼@8½¢
Hallett's.....₩ lb, 7¾¢
Japanese.....₩ lb, 7½¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in.....	$0.35
5/8-in. up to ¾-in.....	.36
½-in. up to 5/8-in.....	.38
3/8-in. up to ½-in.....	.41
5-16-in. up to 3/8-in.....	.48
¼-in. up to 5-16-in.....	.65
3-16-in. up to ¼-in.....	1.00
1/8-in. up to 3-16-in.....	1.50
Smaller than 1/8-in.....	Special
3-in. and larger.....	Special
2-in. to 3-in., to No. 19, inclusive.	.38

35% off.

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—
Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Plats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₩ lb, 2.00....	2.50¢
Nos. 17 to 21.....	₩ lb, 2.10....	2.40¢
Nos. 22 to 24.....	₩ lb, 2.20....	2.50¢
Nos. 25 and 26...	₩ lb, 2.30....	2.60¢
No. 27.....	₩ lb, 2.40....	2.70¢
No. 28.....	₩ lb, 2.50....	2.80¢
American B. B.....		₩ lb, 4¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb. A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb, 8½¢

Galvanized.

Nos. 10 to 16.....	₩ lb, 12¢	75&10& 5% off.
Nos. 17 to 21.....	₩ lb, 13¢	
Nos. 22 to 24.....	₩ lb, 14¢	
Nos. 25 to 26.....	₩ lb, 15¢	
No. 27.....	₩ lb, 16¢	
No. 28.....	₩ lb, 17¢	
No. 29.....	₩ lb, 19¢	
No. 30.....	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½@4½¢
Bar.....5¢
Pipe.....6¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....7¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead. Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1½¢
Red Venetian, American..... @1¾¢
Linseed Oil:
Raw, ₩ gal..... @38¢
Boiled..... @40¢
Spirits Turpentine:
In hbls.....33@33½¢
In cases.....41@41½¢
Putty:
In barrels and ½ bbls..... 1¾@2¢
In tubs.....1¾@2¢
In tin cans..... 2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5 ¢
Clarified.....₩ lb 4⅞¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil, ½c. ₩ lb higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline..... ₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
Wrought " American Unions.....40%
" " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&5%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52'gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized 50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....55%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated..... 40&10%
Solid Bronze.....25%
Porcelain Enamel..... ....40%
Imitation Bronze.....40&10%
1896 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock. ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₩ bbl.	$1.82@$1.83
Rosin, E. & F.....	₩ bbl.	1.84@ 1.87
Rosin, G. & H.....	₩ bbl.	1.90@ 1.95
Rosin, I. & K.....	₩ bbl.	2.00@ 2.05
Rosin, M. & N.....	₩ bbl.	2.10@ 2.25

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.	$3.75@$5.00	
No. 1 Bangor Ribbon.....	3.35@ 3.75	
Pen Argyle, ₩ sqr.....	3.75@ 4.35	
Peach Bottom, ₩ sqr.....	4.75@ 5.60	
No. 1 Chapman, ₩ sqr....	3.80@ 4.80	
Lehigh Slates, ₩ sqr... ..	3.00@ 4.50	

Vermont:

Sea Green, ₩ sqr.....	$2.50@$3.55
Purple, ₩ sqr.....	3.25@ 4.00
Unfading Green, ₩ sqr...	3.75@ 4.50
Red, ₩ sqr.....	9.00@11.00

Solder and Soldering Fluids—Solder—

½&½ guaranteed..... 10¾@11¢
No. 1..... 9¾@10½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb..... .....4¢

5% dis.

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....15½¢@17½¢ net

Spelter—

Western Spelter.....4.65@4¾¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15¼¢
Straits, pigs, lb lb.....14¾¢
Straits, in bars, ₩ lb.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20....	6.75
" "	IXXX,	14 x 20....	7.75
" "	IXXXX,	14 x 20....	8.75
" "	DC,	12½ x 17....	4.25
" "	DX,	12½ x 17....	5.25
Allaway Grade, IC,		10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20...	5.75
" "	IXXX,	14 x 20...	6.50
" "	IXXXX,	14 x 20...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb.....	10¢
95 lb.....	15
90 lb.....	20¢
85 lb.....	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating.....	8.00 @ 9.25
STP Grade, 10 to 12 lb coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade, IC,		14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke, IC,	14 x 20.....	$4.25
IX,	14 x 20.....	5.25

Terne Plates—

MF, IC,	14 x 20.....	$6.30
	20 x 28.....	12.60
Worcester Grade, IC,	14 x 20.....	4.25
	20 x 28.....	8.50
Dean Grade, IC,	14 x 20.....	4.00
	20 x 28.....	8.00
Gilbertson's Old Method, IC,	14 x 20..	7.50
	20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain	72%
1¼ and less, Galv.....	67%
1½ and larger, Plain.....	78%
1½ and larger, Galv.....	70%
Screw and Socket Joint Casing.....	65%
Inserted Joint Casing.....	60%
Boiler Tubes, 2¼ inch and smaller.	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

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Adriance Machine Works... 91
Ætna-Standard Iron & Steel Co 80
American Boiler Co..... 21
American Corrugating Co.. 84
Apollo Iron & Steel Co. ... 1
Atlanta Steel & Tin Plate Co. 82
Bangor Excelsior Slate Co... 71
Barstow Stove Co..... 92
Bascom, H. Clay & Co..... 34
Beaver Tin Plate Co..... 81
Beckwith, P. D. Estate of.... 7
Berger Bros 79
Berger, L. D 78
Berger Mfg. Co..... 85
Bergstrom Bros. & Co..... 15
Bertsch & Co..... 86
Bihh, B. C. Stove Co..... 14
Bishop, G. E..... 89
Bliss, E. W. Co..... 90
Blodgett, G. S. Co..... 9
Blumer-Doscher Mfg. Co..... 76
Bowers, L. M. & Co..... 78
Boynton Furnace Co..... 10
Brand Stove Co 23
Brauer, A. G..... 75
Bray, J. & Co..... 91
Bruce & Cook.....83&92
Buckwalter Stove Co..... 27
Burgess Soldering Furnace Co..... 37
Burrows, F. S..... 75
Burton, W. J. & Co..... 80
Calovit Heating Co..... 30
Cambridge Roofing Co..... 84
Canton Steel Roofing Co..... 84
Carton Furnace Co..... 3
Castle, W. & Co..... 21
Central Stamping Co..... 40
Cheney, S. & Son..... 1
Cincinnati Corrugating Co.. 85
Cincinnati Pattern Works.. 34
Clark, H. N. Co..... 35
Cleveland Gas Machine Co.. 37
Clough, R. M..... 90
Coe, Jas. A. & Co..... 77
Colwell Lead Co..... 39
Connors, Wm..... 1
Cooney, Selner & Co..... 78
Cope, Geo. W..... 34
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Crosby, G. A. & Co..... 88
Curtis & Curtis..... 37
Detroit Furnace & Heater Co..... 28
Detroit Smelting & Refining Co..... 75
Dixon, Jos. Crucible Co .. 76
Double Truss Cornice Brake Co..... 87
Dover Stamping Co..... 42
Drake, W. H..... 21
Eastwood Wire Mfg. Co..... 1
Eclipse Stove Co.. .....8&14
Eller, J. H. & Co..... 85
Excelsior Steel Furnace Co. 20
Follansbee Bros. Co 80
Forest City Fdry. & Mfg. Co 36
Fowler & Wolfe Mfg. Co. ... 26
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Fox Furnace Co..... 15
Frand, M. J. & Co..... 78
Friedley & Voshardt..... 84
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Garry Iron & Steel Roofing Co..... 88
Gem City Stove Co..... 11
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Johnson & Co., 84 John St., N. Y.
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Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co., Boston, Mass.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Iron, Galvanized Sheet. (*See Sheets, Galvanized.*)

Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lard Cans.
Kieckhefer Bros. Co., Milwaukee, Wis.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Huse, Jos. & Son, Boston, Mass.
Muuseil, Eugene & Co., 218 Water St., New York.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Fitter and Crimper.
Blumer, Doscher Mfg. Co., Brooklyn, N. Y.

Pipe Hangers.
Iwan Bros., Streator, Ill.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Oster Mfg. Co., Cleveland, Ohio.
Peck Bros. & Co., New Haven, Conn.
Randolph & Clowes, Waterbury, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson, R. M., Rome, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

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Adriance Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.

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Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.

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Gorman-English Co., Wilkes Barre, Pa.

Radiators, Hot Air.
Castle, Wilmot & Co., Rochester, N. Y.
Rochester Radiator Co., Rochester, N. Y.
Waste Heat Radiator Co., Buffalo, N. Y.

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Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
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Reflectors.
Frink, I. P., 551 Pearl St., New York.

Registers.
Berger Bros., Phila., Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Highton, Wm. & Sons, Boston, Mass.
Kernan Furnace Co., Utica, N. Y.
Schreiber & Conchar Mfg. Co., Dubuque, Iowa.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

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Hill-Whitney Aluminum Co., Boston, Mass.
Shepard, Sidney & Co., Buffalo, N. Y.

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Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J
Phila. Steel Roofing Co., Phila., Pa.
Soutner, E. E. Iron Co., St. Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Ct.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., East Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., New Haven, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Pocock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Mach. & Tool Co., Toledo, O.
Watrous & Co., Troy, N. Y.
West Mfg. Co., Buffalo, N. Y.

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Sheet Metal Work.
Willis Mfg. Co., Galesburg, Ill.

Sheets, Iron and Steel.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N.Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia Pa.

Sheets, Galvanized.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McCluro & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burden, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff st., N. Y.

Skylights.
Rasuer & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.
Watrous & Co., Troy, N. Y

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties Manufactured.
Burrows, F. S., 107 Beekman St., N. Y.

Statuary, Sheet Metal.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.
Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
White, N. E. Co., Utica, N. Y.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind.

Stove Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Berger Bros, Phila., Pa.
Marlin & Co., Pittsourgh, Pa.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.
Parks & Parks, Troy, N. Y.

Stove Putty.
Connors, Wm., Troy, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Clark, Henry N. Co, Boston, Mass.
Howes, The S. M Co., Boston, Mass.
Kieffer Bros., Syracuse, N. Y.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Morris, J. L., Chicago, Ill.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.

Stove Trucks.
Gwinner Mfg. Co., Cincinnati, O.
Howes, The S. M. Co., Boston, Mass.
Morsick, C. S. & Co., New Haven, Ct.

Stoves and Ranges.
Beekwith, P. D., Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bihb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Brand Stove Co., Milwaukee, Wis.
Buckwalter Stove Co., Royersford, Pa.
Bussey & McLeod Stove Co., Troy, N.Y.
Eclipse Stove Co., Mansfield, O.
Gem City Stove Co., Dayton, O.
Graff & Co., 208 Water St., N. Y.
Howes, The S. M. Co., Boston, Mass.
Magee Furnace Co., Boston, Mass
March-Brownback Stove Co., Pottstown, Pa.
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Rathbone, Sard & Co., Albany, N. Y.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schuylkill Valley Stove Co., Spring City, Pa.
Sheppard, Isaac A. & Co., Phila., Pa.
Somerset Stove Foundry Co, Somerset Mass.
Thatcher Furnace Co., 240 Water St., New York.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Adler, H., Tr., Pittsburgh, Pa.
Calovit Heating Co., Brooklyn, N. Y.
Reineke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Miller, Edward Co., Meriden, Conn.
Monarch Stove Co., Mansfield, O.
Rathbone, Sard & Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., New York.
Rochester Stamping Wks., Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Tea Pots.
Rochestor Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Tools, Machines and Supplies.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bishop, G. E., Dowagiac, Mich.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St, N. Y.
West Mfg. Co., Buffalo, N. Y.

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Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleekhefer Bros. Co., Milwaukee, Wis.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Tubing, Brass and Copper.
Randolph & Clowes, Waterbury, Conn.

Valves.
Eastwood Wire Mfg. Co., Belleville, N. J.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.
Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.
Littleford Bros., Cincinnati, O.
Marston, I. G. & Co., Boston, Mass.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co, 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

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A FOREMAN to take charge of a metal cornice, skylight and jobbing shop; one who thoroughly understands the business and can estimate on work from architects' plans. "Foreman," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Nov. 6

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Experienced SALESMAN in Western New York tor 1898 by a large stove and furnace manufacturer who manufactures a tull line of goods appropriate for this market; must have experience and a calling among the trade of this section. "Experience," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

At once, a good all around TINNER and SHEET METAL WORKER for inside and outside work; must be sober and reliable. C. T. Childers, Galesburg, Ill. Nov. 6

A man who understands FURNACE and CORNICE WORK; must be able to cut and detail work; steady work year around; unless first-class do not apply; state wages wanted. King Bros., Danville, Ill. Nov. 6

To correspond with SALESMAN visiting stove and hardware trade in Boston, Mass., and adjacent territory, who can handle a first-class line of oil lamp stoves and gas hot plates. Address, giving particulars, "Stoves," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

Fred. C. Andrews, tinner, can learn of a good job by addressing "J. C. D.," 35 Washington street, Buffalo, N. Y. Nov. 6

PLUMBER and TINNER at once; one who can wipe a joint; must be sober and steady. Address, with price, Geo. W. Gibney, Pawling, N. Y. Nov. 6

A good, honest boy, 16 or 17 years of age, to learn the tinsmith and plumbing trades; must serve three years; a boy who smokes or is profane need not apply; the terms are, with board and washing, $30 first year, $40 second year, and $50 last year. A. W. Kreidel, Lititz, Pa. Nov. 6

Several first-class STOVE SALESMEN for Western territory, competent to handle complete lines of stoves, furnaces and gas stoves. Address, by mail, stating experience, past sales, territory covered, age, and salary expected, Detroit Stove Works, Chicago, Ill. Nov. 6

A BRASS MOLDER capable of turning out absolutely smooth, perfect castings; none other need apply; state references and wages. "Castings," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Nov. 6

A good STEAM and HOT WATER FITTER with some knowledge of plumbing in a Connecticut town; a good place for the right man. "Nutmeg," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

A TINNER who can drive slate; one who can do plumbing or steam heating preferred. W. A. Gephart, St. Clairsville, Ohio. Oct. 30

A TINSMITH; to the right man we will give steady work; address, stating age, experience, nationality and wages expected. Perry, Read & Co., Hinesburgh, Vt. Oct. 30

A first-class COPPERSMITH to take charge of a shop manufacturing range boilers and other similar work; must have good habits and be able to turn out work at the lowest possible cost consistent with good workmanship. "W. H. S.", No. 1030, office of *The Metal Worker*, 232-238 William street, New York City Oct. 30

Two first-class SALESMEN to sell stoves; don't apply unless you have had two years' experience on the road; state age, experience, amount of annual sales, territory covered and salary expected. Address by mail Detroit Stove Works, Detroit, Mich. Oct. 30

A good TINSMITH and JOBBER to come and locate in a live New England town. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

A man possessing necessary qualifications to start and conduct a new department for our company, furnaces, steam and hot water heaters: must be competent to make or direct drawings for patterns aud superintend entire department. Address by mail, stating age and giving full particulars as to your knowledge and experience, Detroit Stove Works, Detroit, Mich. Oct. 30

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SALESMAN of experience, acquainted with department stores, house furnishing, hardware and tin trade in Philadelphia, would like the account of a first-class house for city or road. "M.," 404 Lippincott Building, Philadelphia, Pa. Nov. 6

BOOKKEEPER.—Practical double entry bookkeeper and cashier of many years' experience, possessing energy and business abilities, is open for engagement with wholesale house or manufactuing concern; A1 penman and correspondent; best of references as to character, &c. 312 Walnut street, Williamsport, Pa. Nov. 6

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BOILER SALESMAN of ability and experience open for engagement December 1; thoroughly experienced in all manner of steam and water warming; well known to the trade in Pennsylvania and Maryland, and can furnish highest references; no objections to going elsewhere. "S. C. W.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

Good strong HELPER: can do jobbing, plumbing or roofing, or will take a job at anything: does not use tobacco or liquor. M. J. Walsh, 407 East Eighty-first street, New York City. Nov. 6

By first-class PLUMBER, HOT WATER and STEAM PIPER; good all around man. "L.," office of *The Metal Worker*, 70 Kilby street. Boston, Mass. Nov. 6

To represent some good stove manufacturing company or some line that will interest the retail hardware trade in Ohio, Maryland or Illinois; seven years' experience in those States for one among the best of stove manufacturers; unquestionable references. A. H. Reist, 594 West Fifth street, Dayton, Ohio. Nov. 6

With a good stove manufacturing concern making a line of goods suitable for either Western or Southern trade, by a party who has both experience and acquaintance in Indiana, Illinois, Missouri. South and Southwestern States. "W.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Nov. 6

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As HAMMERSMAN and RAISER, hand or machine, by a thoroughly competent and reliable mechanic and cornice man. "Reliable," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

A line of STAPLE STOVES and GASOLINE STOVES to sell on margins or commission in Ohio, Indiana, Michigan and Kentucky, by a party well acquainted with the trade; references unexceptonable. "X.," office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. Nov. 6

By a first-class ROOFER, jobbing or new work; can make leaders, gutters, leader heads; good at shop work; would like to be in a first-class shop where he could work on rainy days. J. Black, 87 India street, Greenpoint, L. I. Nov. 6

A practical STEAM and WATER ENGINEER and SALESMAN, thoroughly acquainted with blower work also, will be open for engagement Nov. 15. "R. M. H.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

SHEET METAL, CORNICES, SKYLIGHTS, MILL and BLOW PIPE WORK, TIN ROOFING, anything in the sheet metal line; rare ability in every department of the above; fine pattern cutter; American, age 30; correspondence solicited from any part of the United States. "J. A. H.," 79 Green street, Newark, N. J. Nov. 6

By a practical PLUMBER, GAS, STEAM and HOT WATER FITTER; can measure and work from plans and estimate all work. "A.," 12 Garnet street, Brooklyn, N. Y. Nov. 6

A bright, well educated young man (22), excellent mercantile training, principally experienced in hardware and heatiug business, figuring, estimating from plans, &c., also competent D. E. bookkeeper, A1 penman, correspondent and salesman, wants position in any business where exceptional ability, energy, perseverance and adaptability will merit advancement; will go anywhere. "Advance," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

By PLUMBER; graduate New York Trade School; six years' practical experience; married, sober and reliable; can furnish excellent references as to character and workmanship; wages $2 per day. Box 299, Ithaca, N. Y. Nov. 6

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By a BOOK-KEEPER. 14 years' experience with one firm; 32 years of age; married; excellent reference. Wm. Sturz, 429 Pulaski street, Brooklyn, N. Y. Oct. 30.

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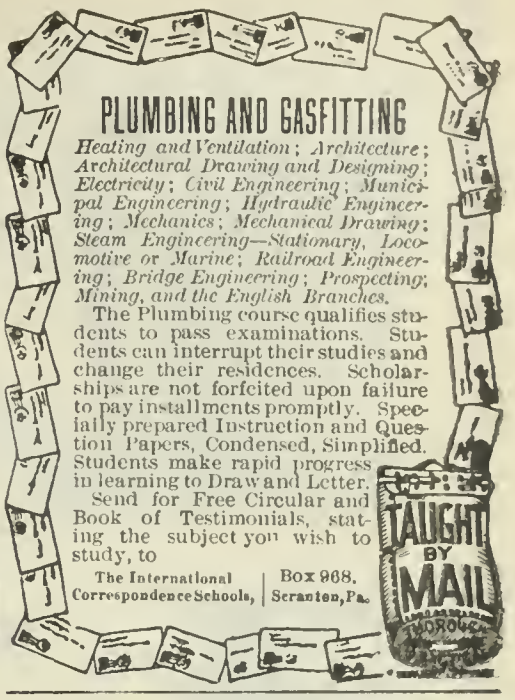
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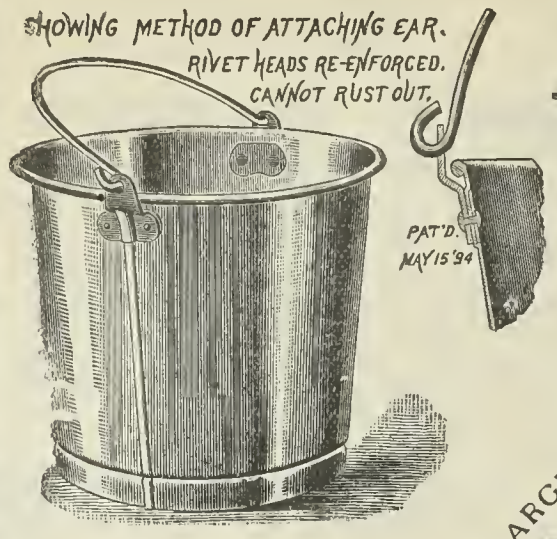

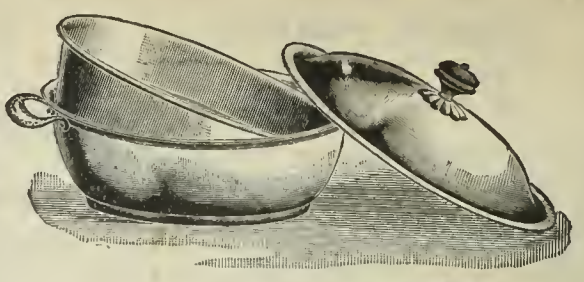

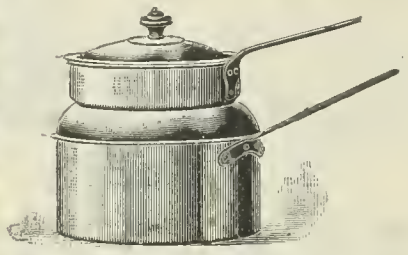

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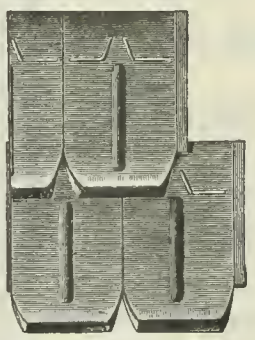

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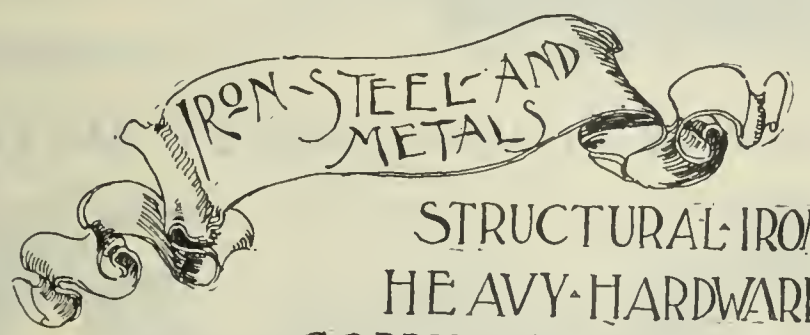

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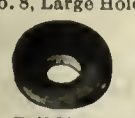

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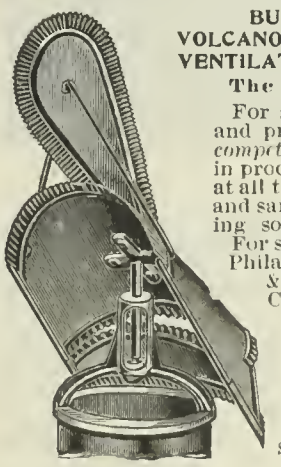

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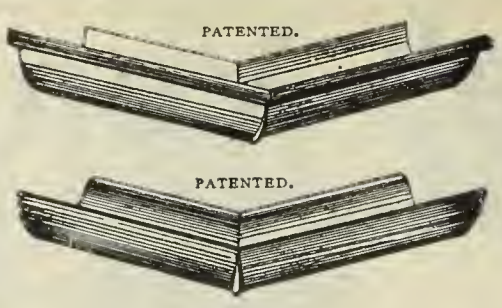

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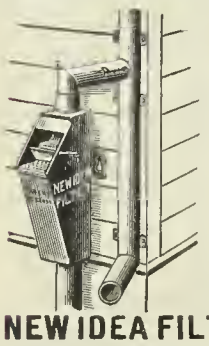

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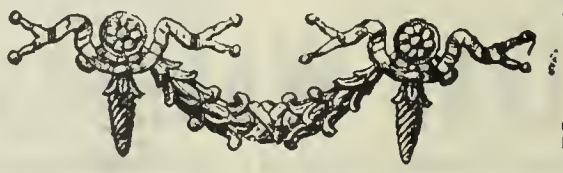

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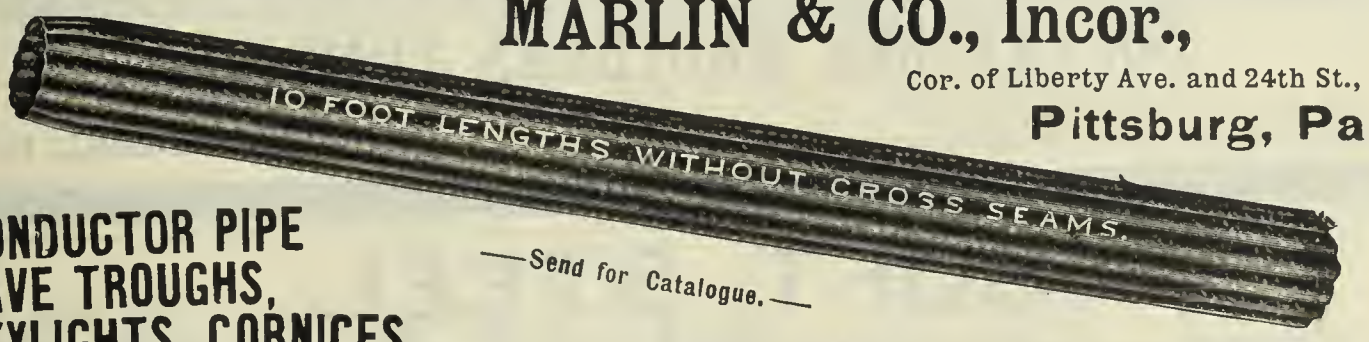

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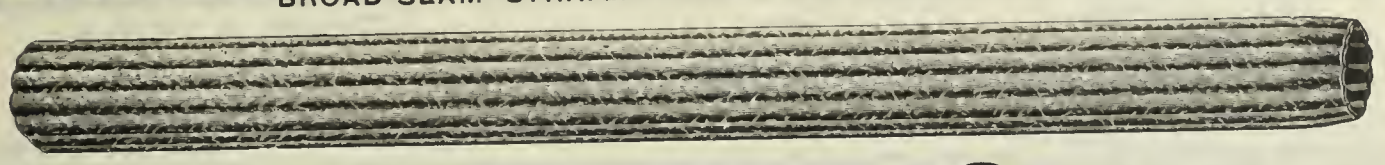

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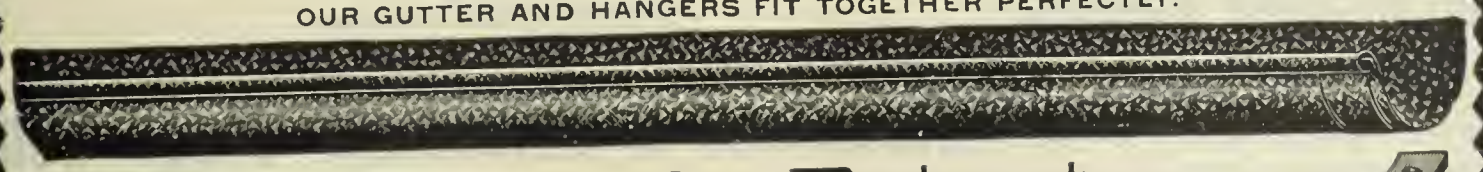

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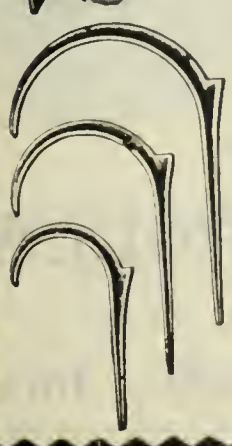

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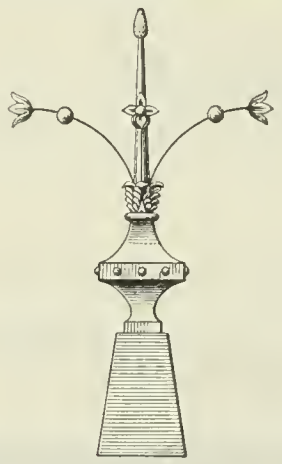

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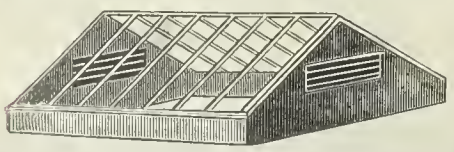

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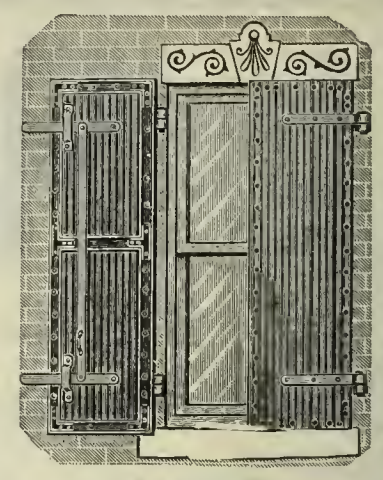

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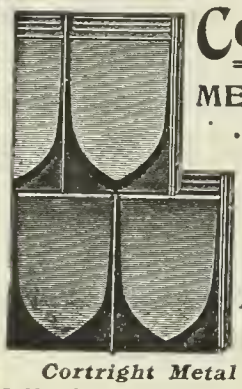

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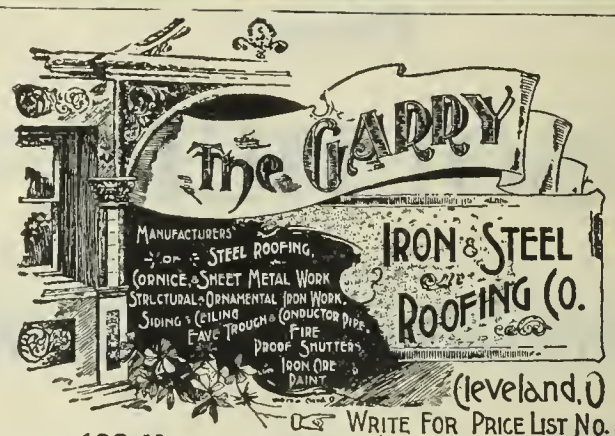
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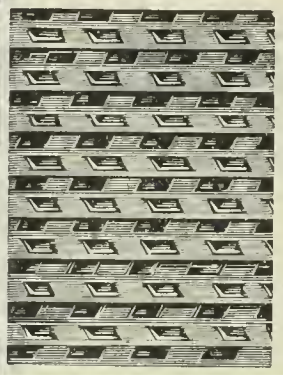

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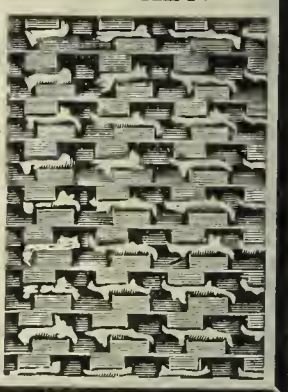

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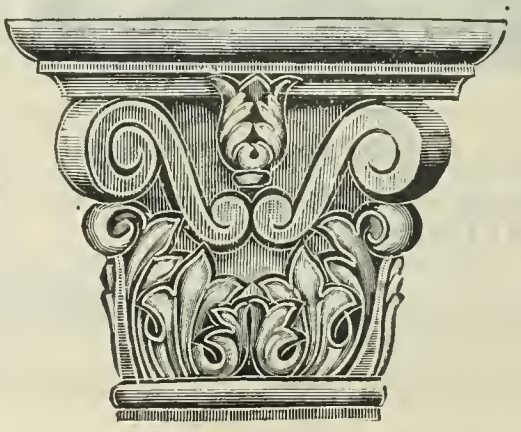

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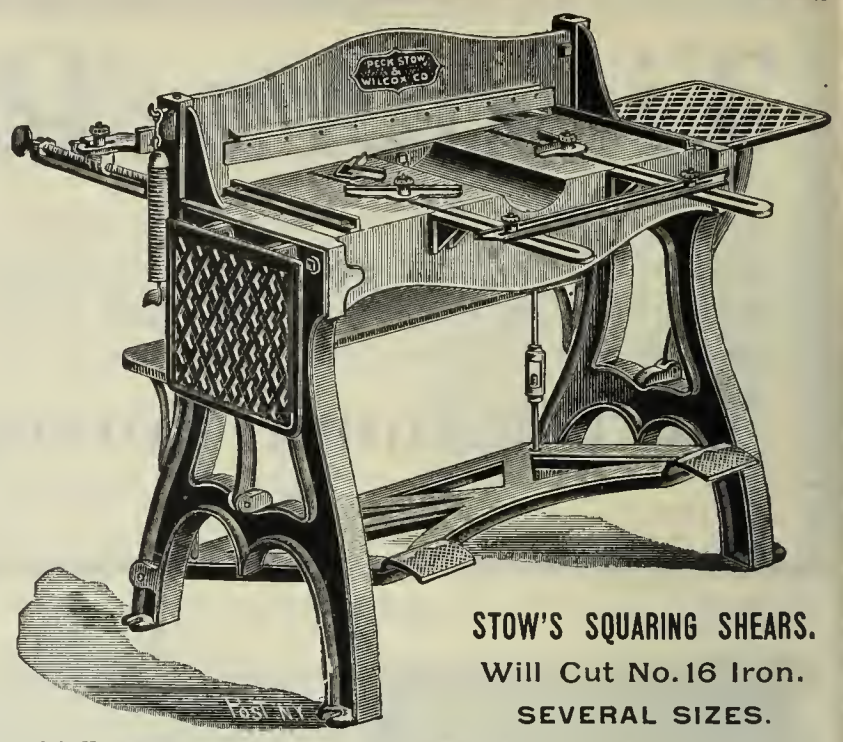

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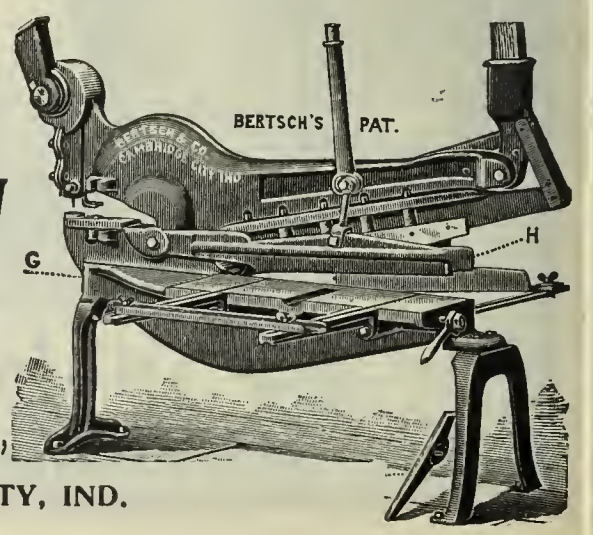

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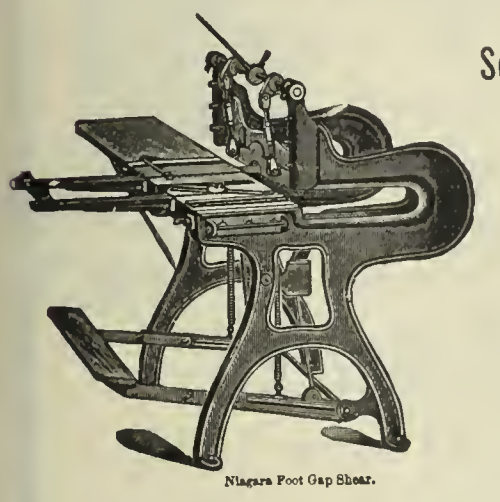

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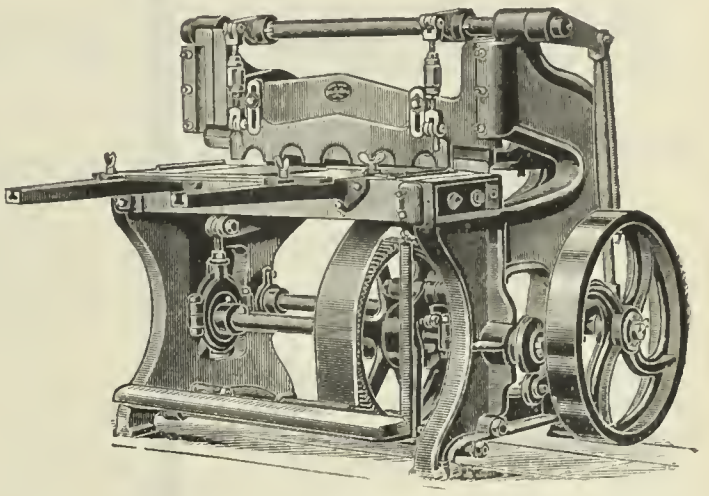

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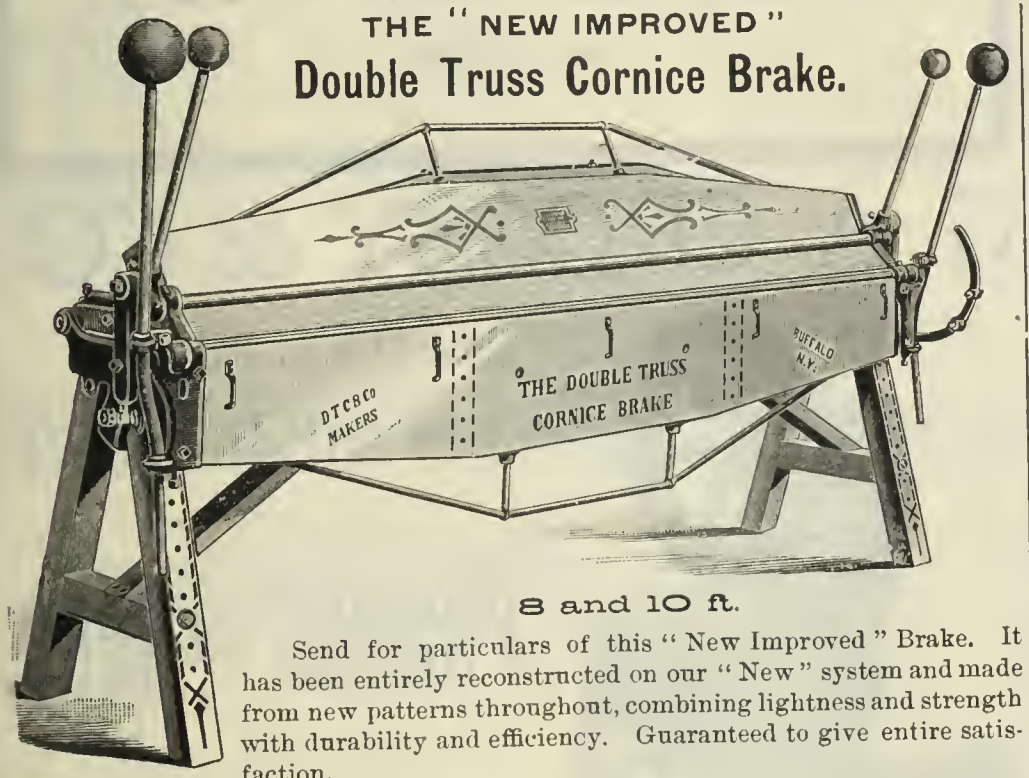

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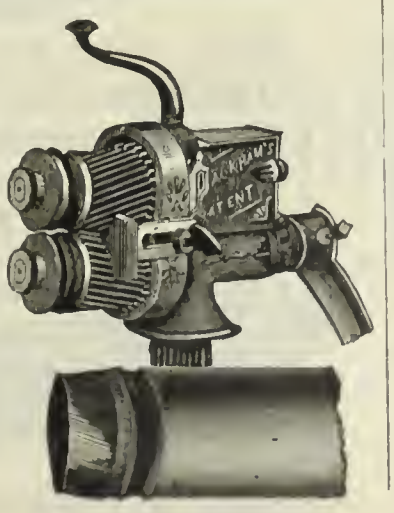

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CONTENTS.

While Chapter VI, comprising the greater part of the work, is devoted to the solution of problems, the five preceding chapters thoroughly explain the principles of pattern cutting, and place the student in possession of the preliminary information necessary to a thorough understanding of the subject.

SUMMARY OF CONTENTS.

I. Terms and Definitions—15 pages.
II. Drawing Instruments and Materials—13 pages.
III. Linear Drawing—6 pages.
IV. Geometrical Problems—35 pages.
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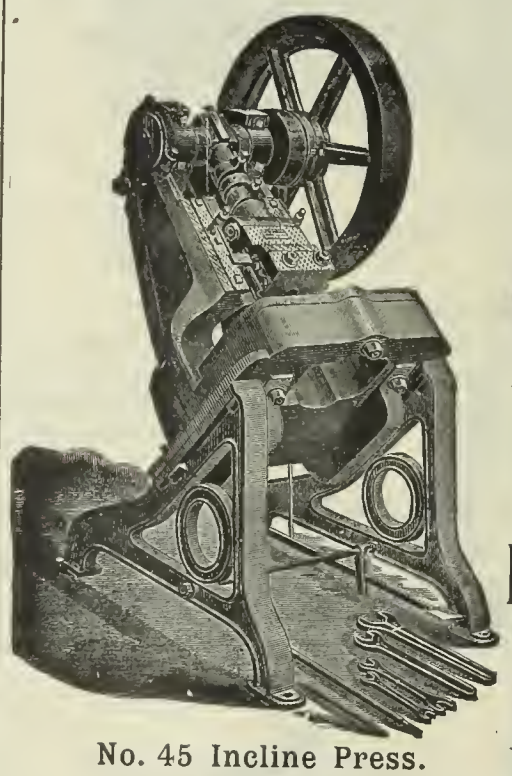

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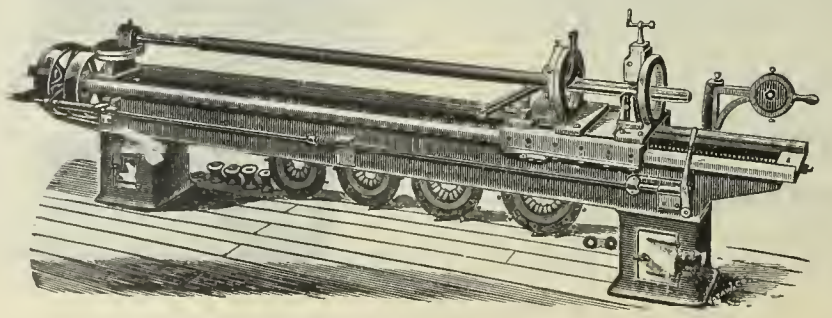

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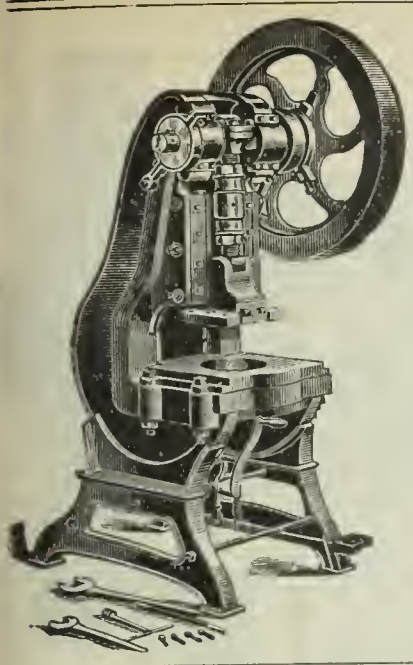

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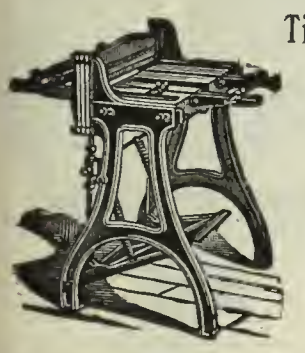

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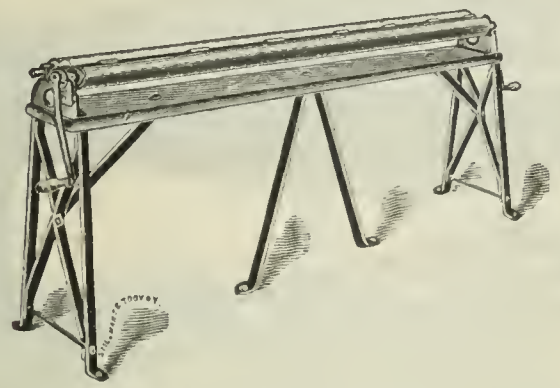

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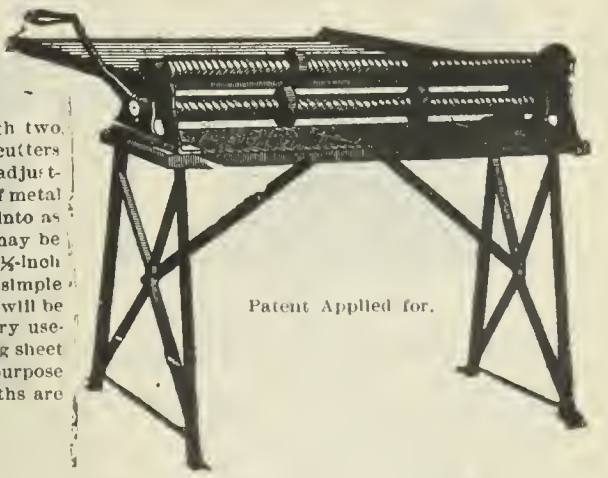

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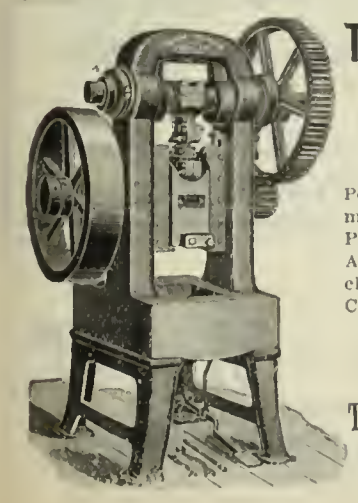

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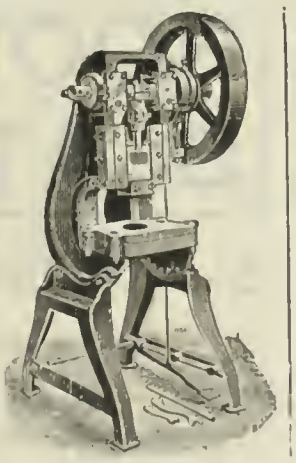

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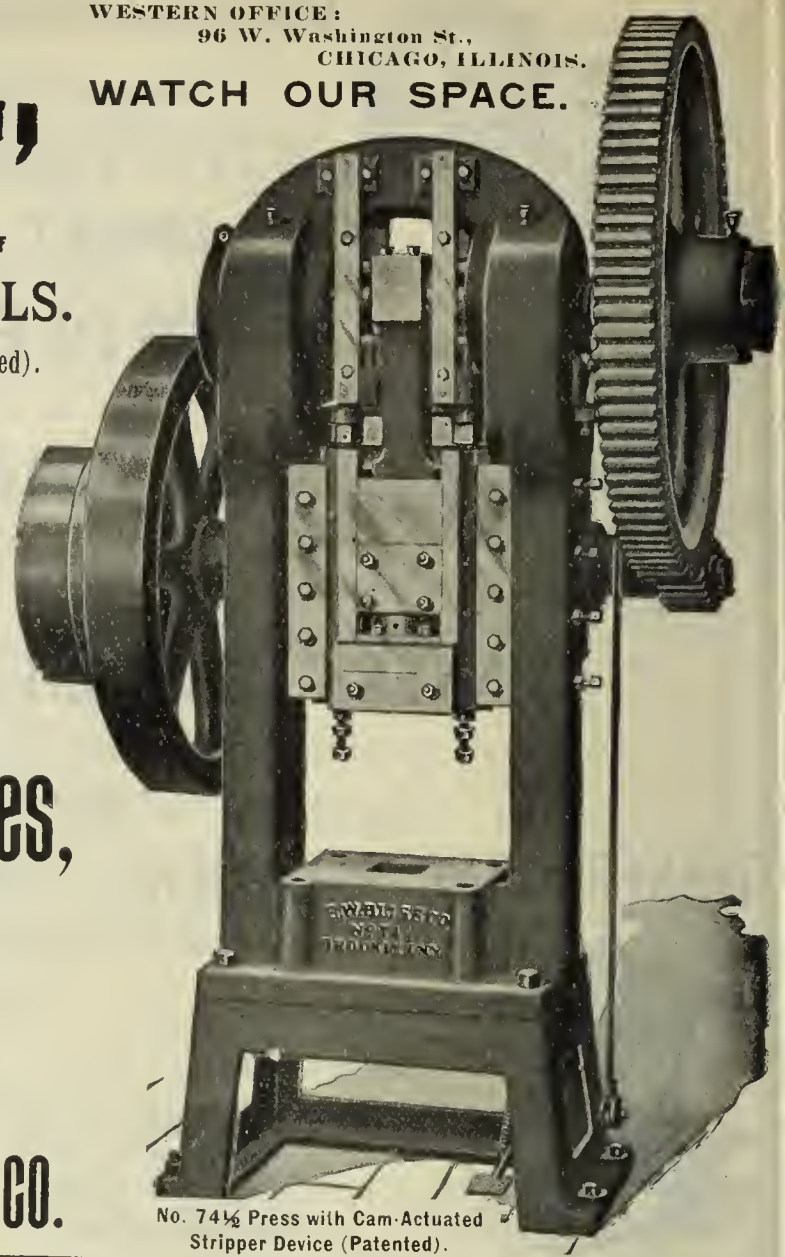

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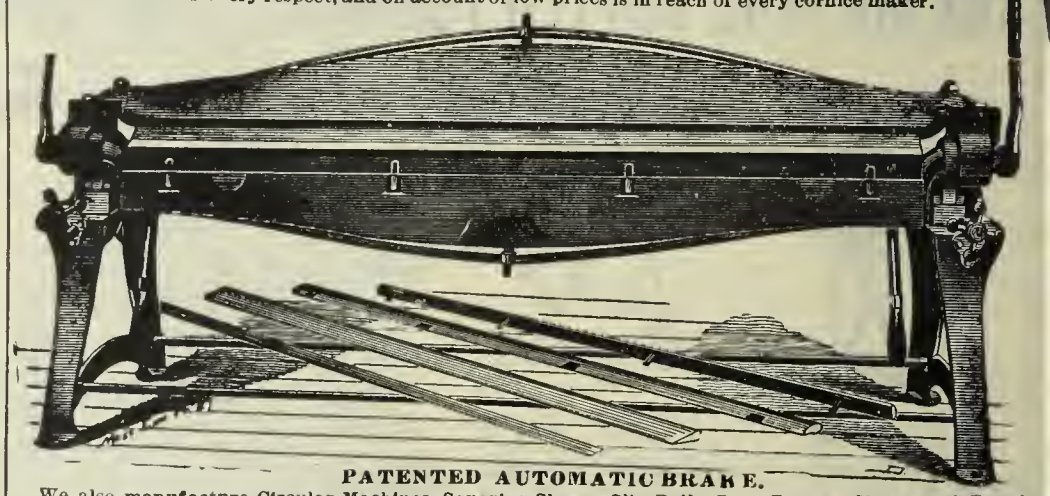

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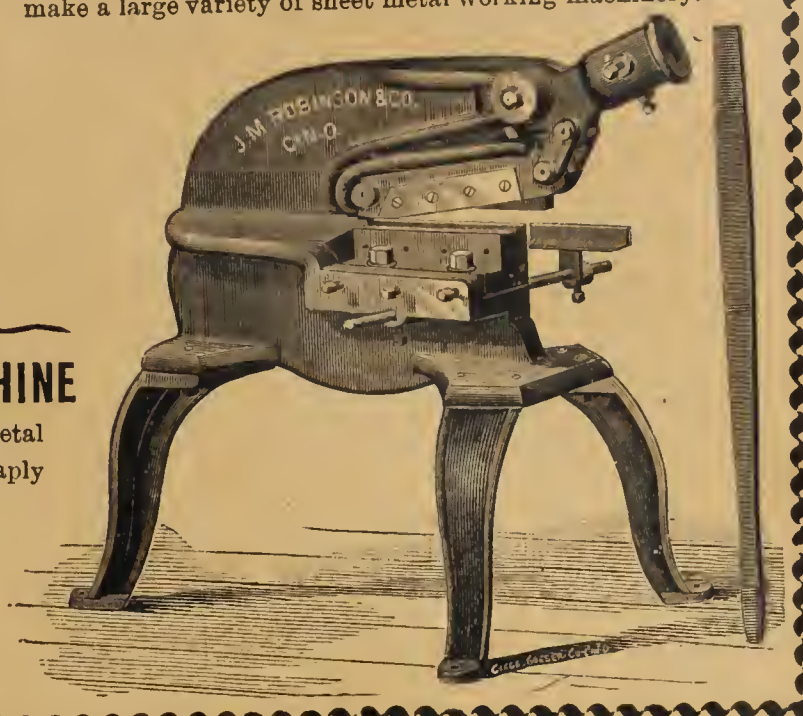

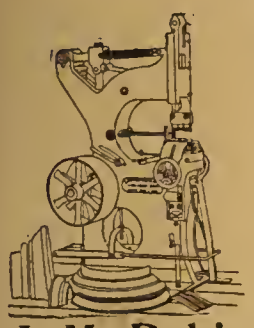

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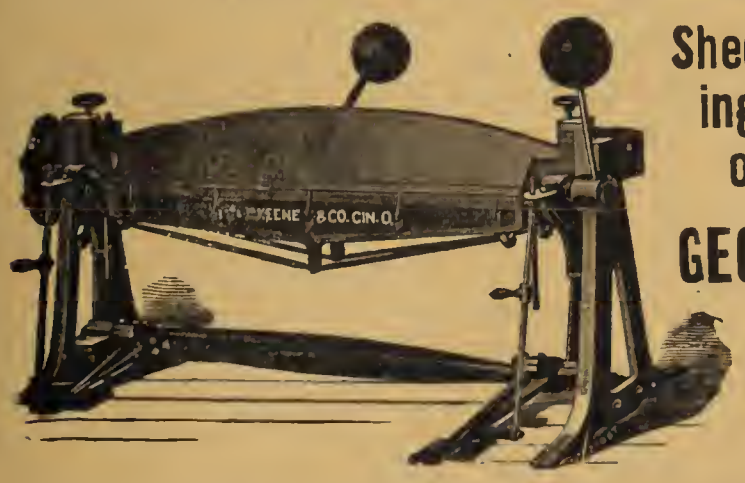

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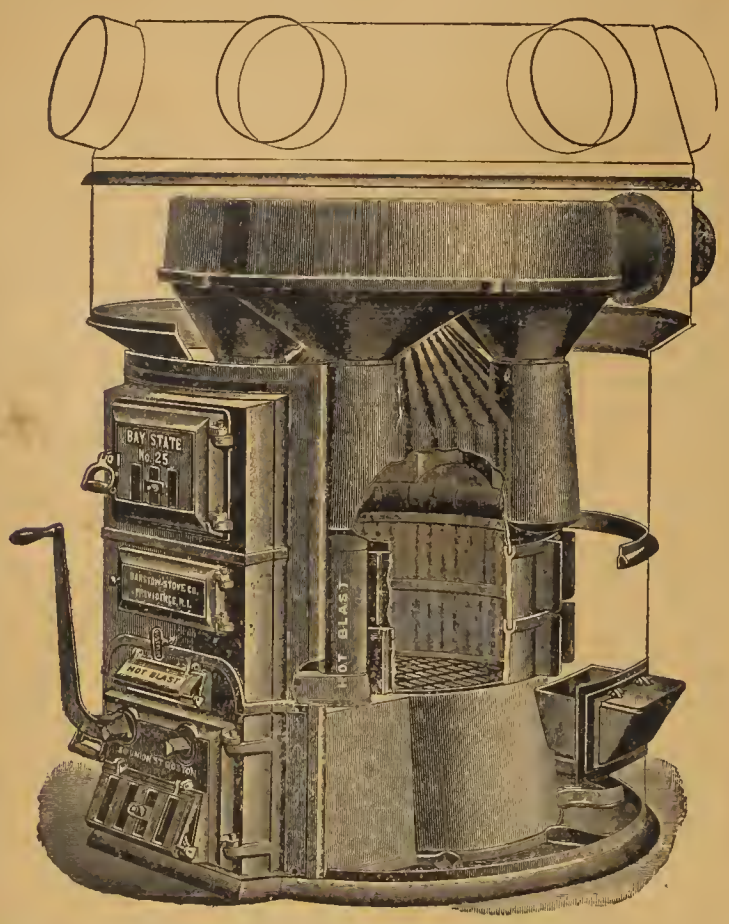

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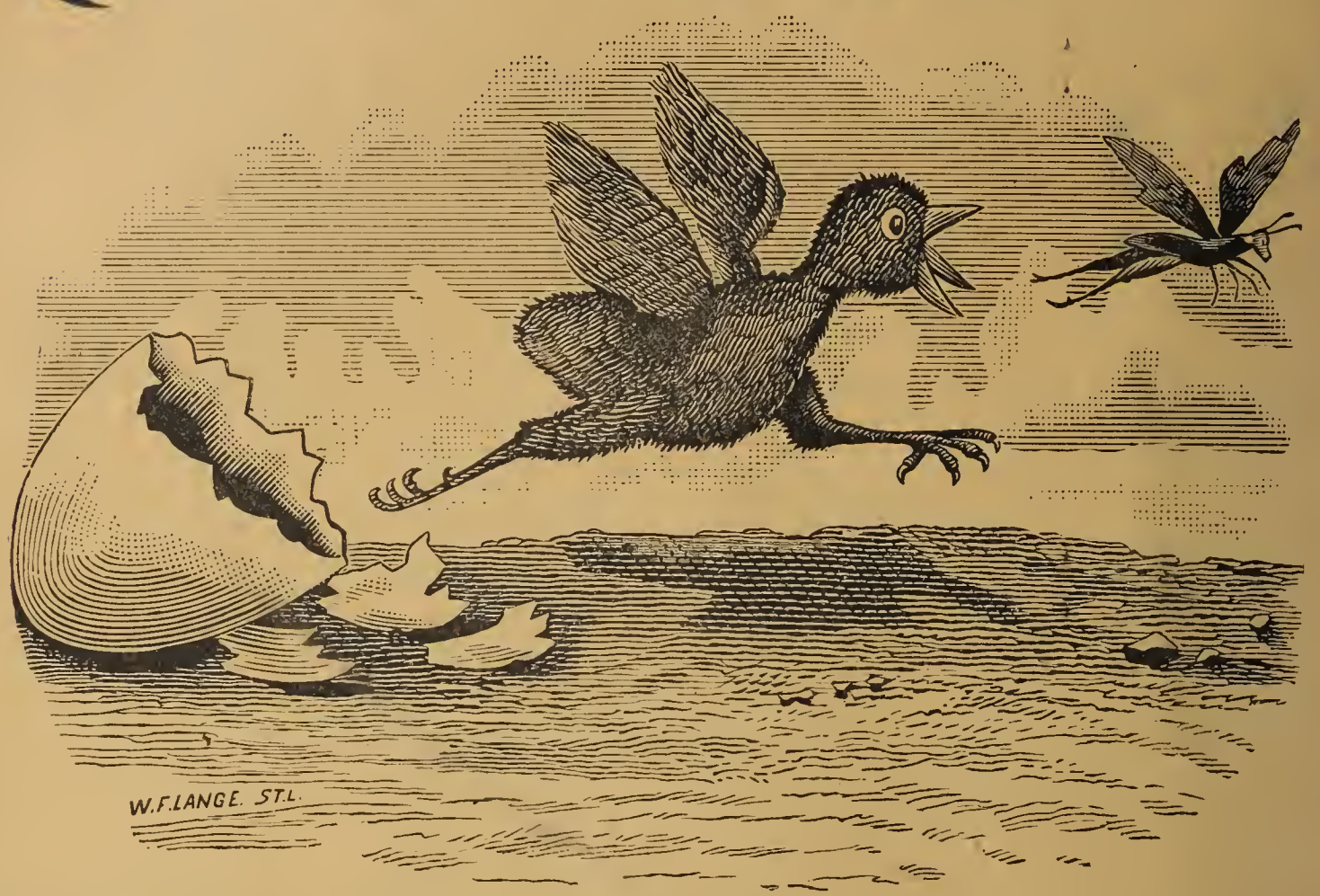

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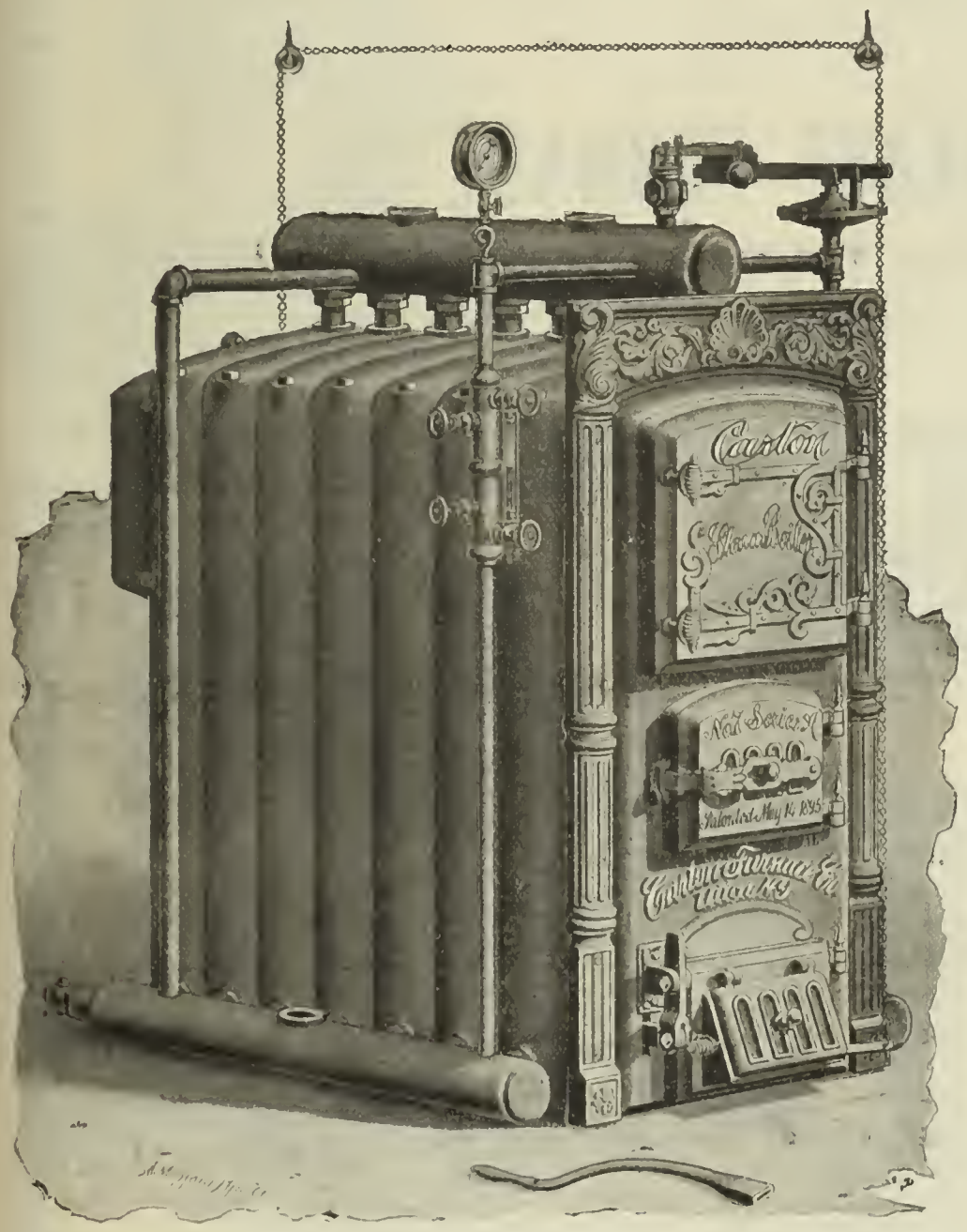

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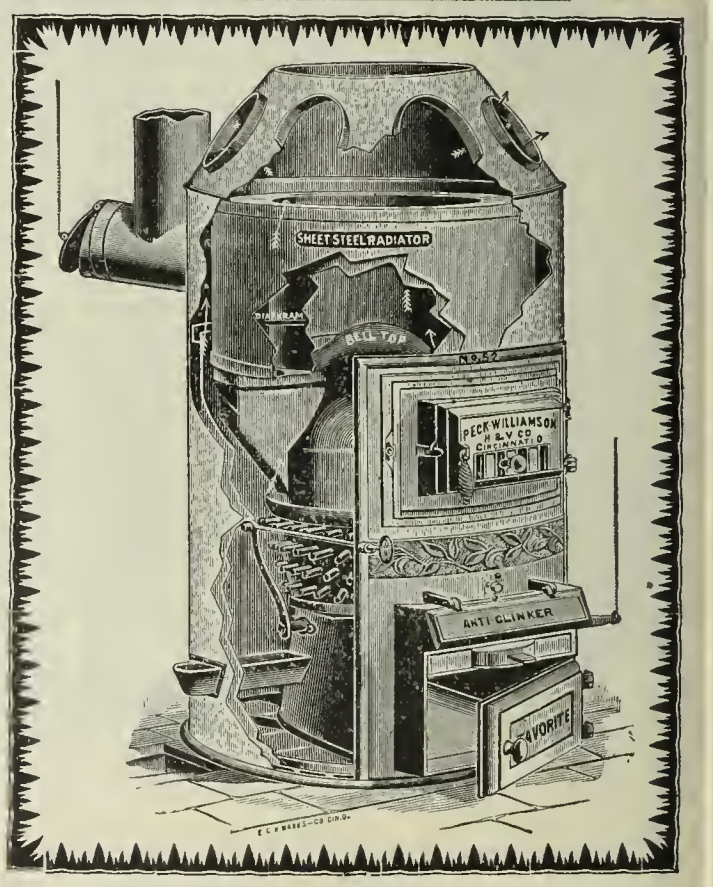

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Save Your Coal. Save Your Coal.

RUSSEL WHEELER & SON
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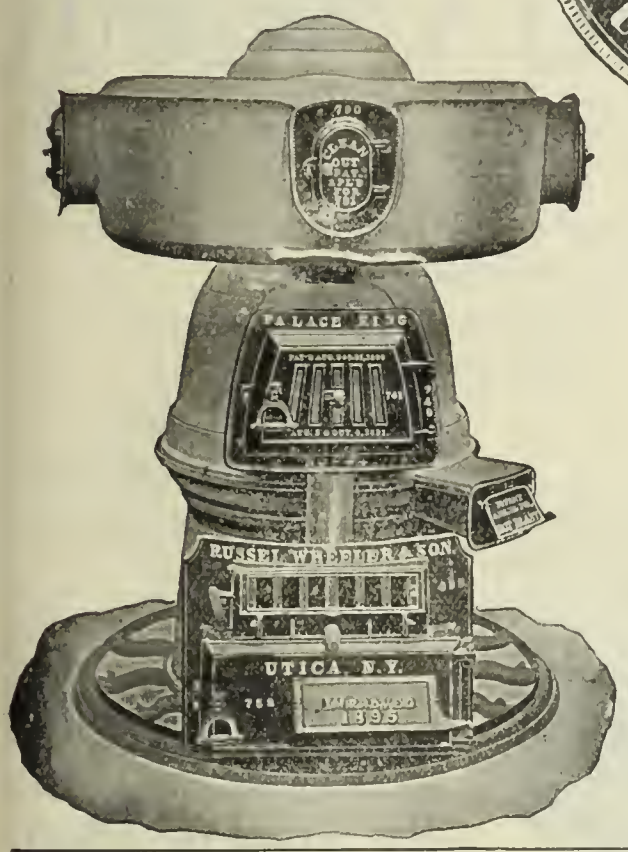
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.



IN CASE OF FIRE,
SAVE YOUR COAL.

You can Save Coal, and Money too, by using our Heaters.

THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

TUESDAY AND FRIDAY,
221 SOUTH FIFTH STREET,
PHILADELPHIA.

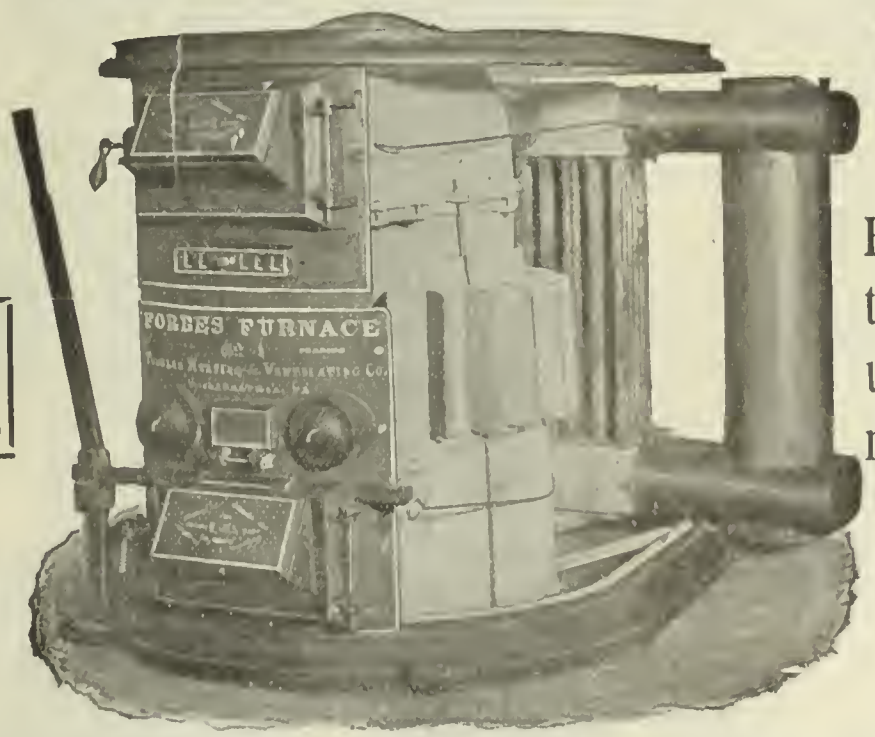
HATBORO, PA., Dec. 26th, 1896.

MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.

MY DEAR SIR:

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal

Very truly,
I. N. EVANS.



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COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

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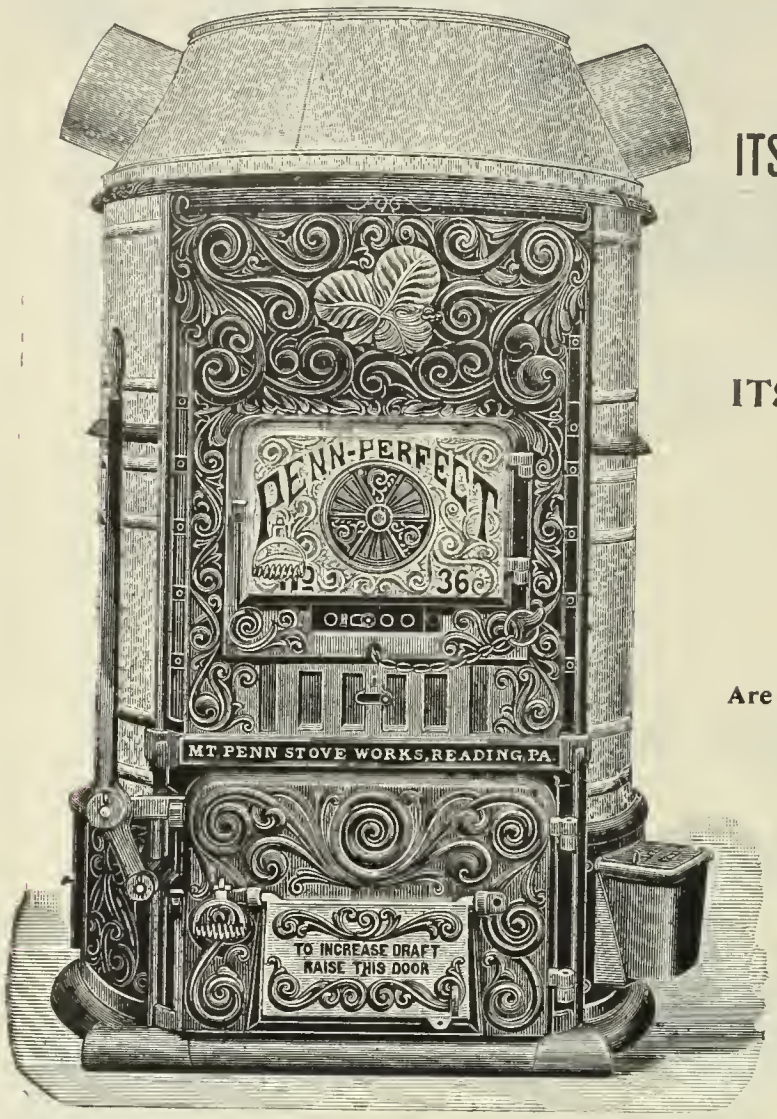
The PENN PERFECT



IS A FURNACE WELL WORTHY OF ITS NAME.

ITS BIG VALUE

IS EASILY SEEN AND UNDERSTOOD.

ITS Massive Ornamental Front,
Perfect Grate, Large Ash Pit,
Automatic Check Draft Damper,
OXYGEN BURNER,
Sectional Fire Pot, and
Large Vapor Pan
Are Special Features which make the Furnace particularly attractive to a customer.

MT. PENN STOVES & RANGES READING PA.

It Burns Any Kind of Fuel.

The phenomenal success attending its introduction early last year, and the lively demand it has met since it was introduced, prove conclusively that it is

A GOOD SELLER.

IT IS MADE IN SIX SIZES.

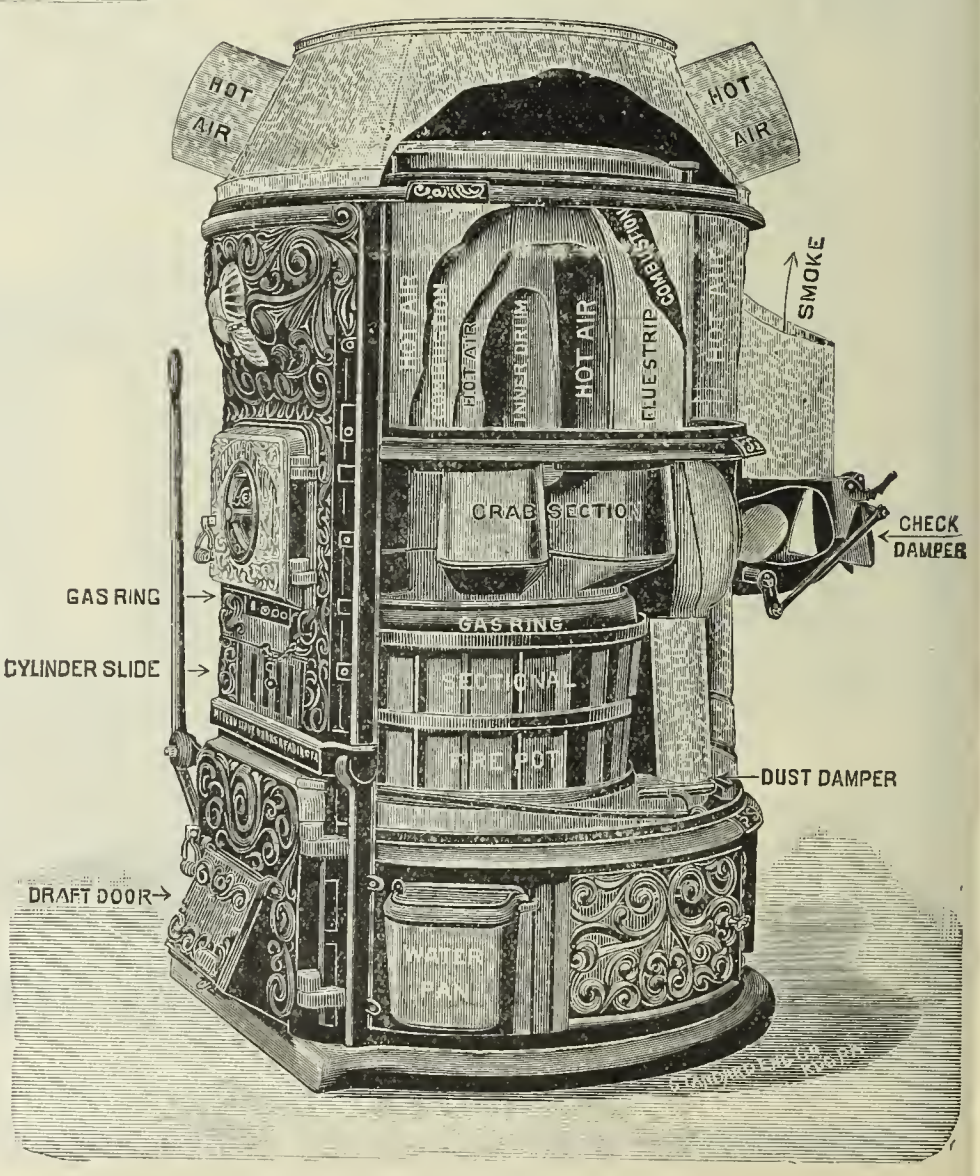
☞ We should like you to have more particulars in regard to this furnace. We have a little pamphlet describing it, which will be mailed on receipt of a postal from you.

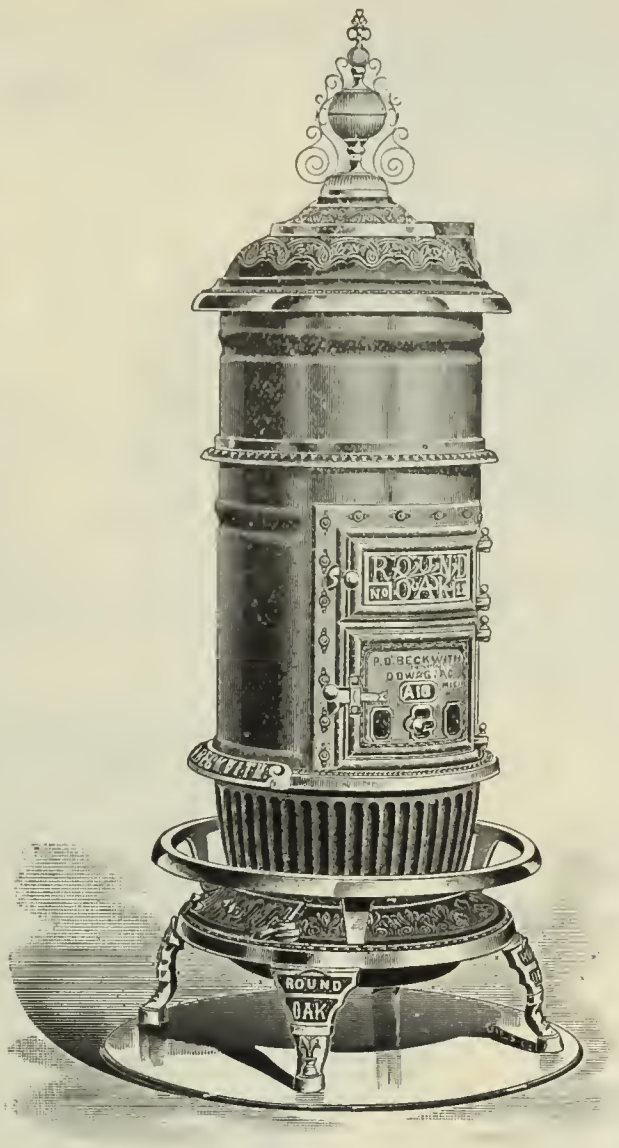
THE

Mt. Penn Stove Wks.,

READING, PA.

Philadelphia Store, 111-113 N. 2dSt.





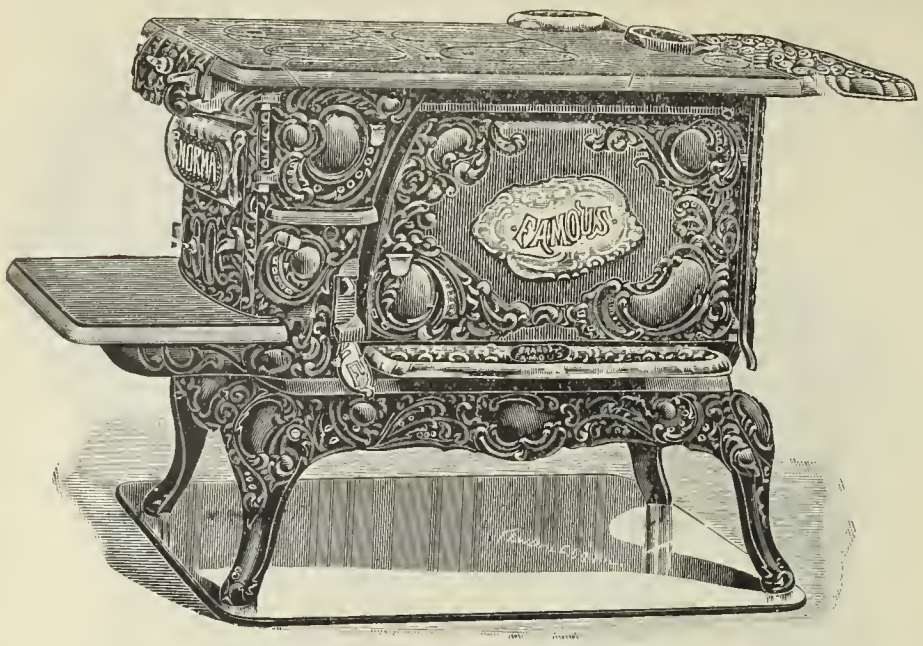
"It has no Ash pan."

And yet its sale is nearly *one-third* the *entire output of* "Oaks." *Why?*

Nearly 4,000 Dealers know! and the catalogue makes it plain.

Shall we send it?

EST. P. D. BECKWITH,
DOWAGIAC, MICH.



Famous Norma and Res.
FOR COAL AND WOOD.

Brand's Famous

Norma Cook.

FOR HARD OR
SOFT COAL OR
WOOD.

The Best Cook Stove for the money in the world.

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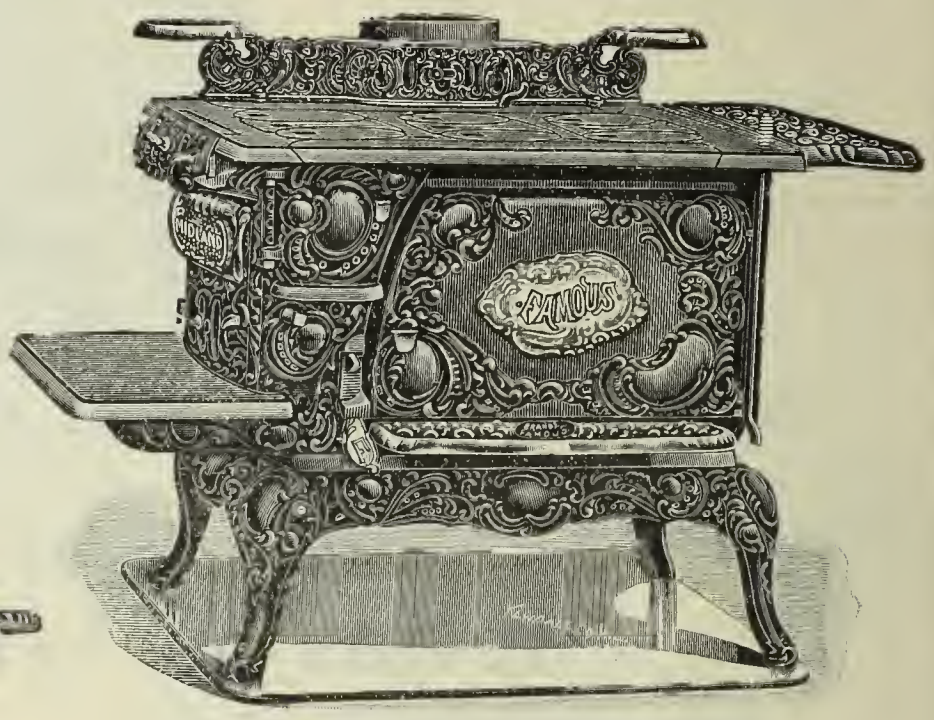
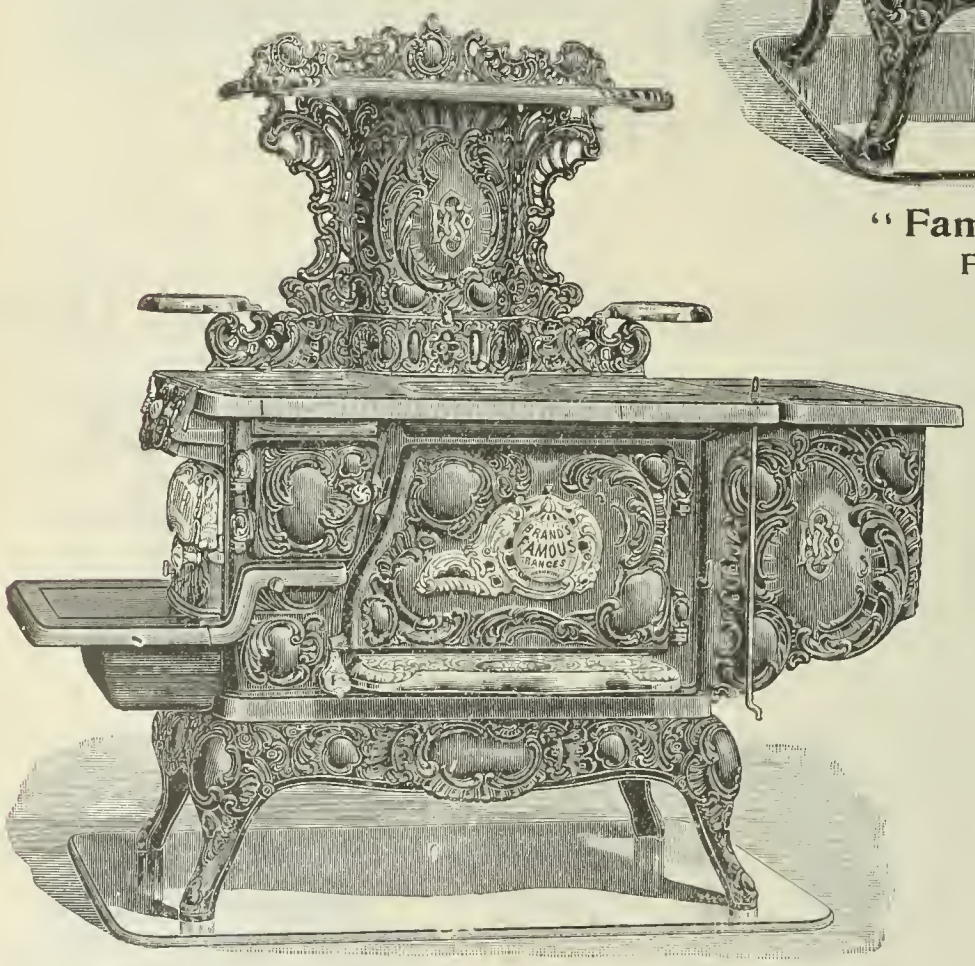
The Latest Design in Ranges. Cannot Be Equalled Anywhere.



"Famous" Midland Range.
FOR COAL AND WOOD.



Brand's Famous Eureka Range.
FOR COAL OR WOOD.

Brand's Famous

Eureka Range.

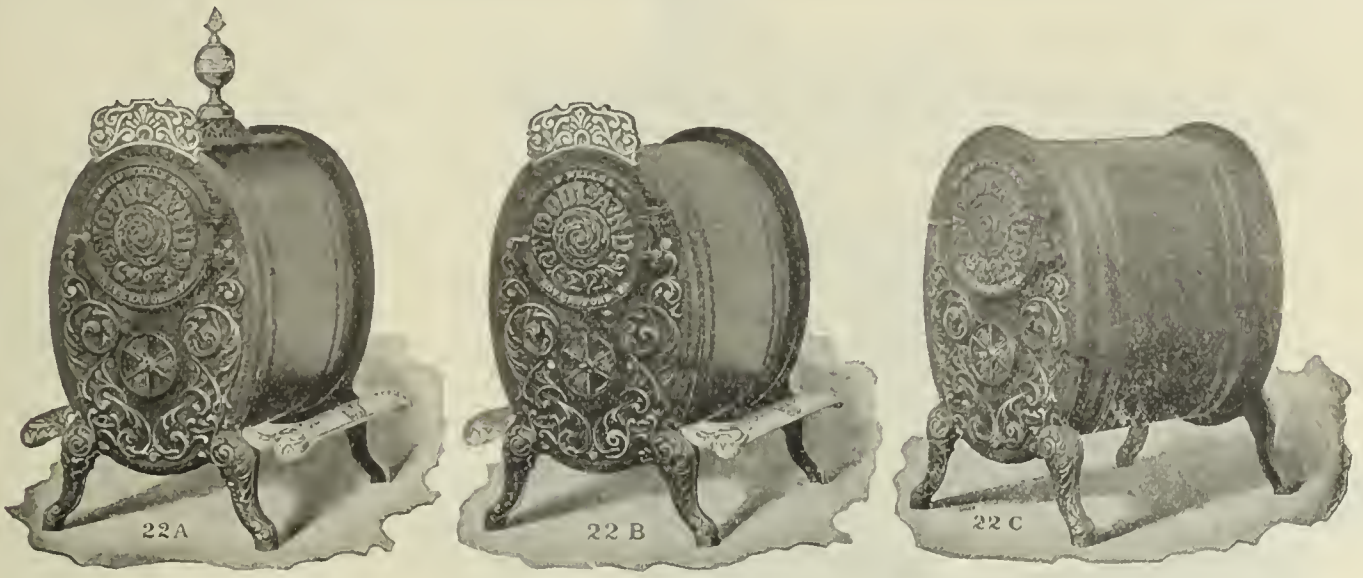
FOR HARD OR
SOFT COAL OR
WOOD.

Strictly First Class.
Handsome Design.
Smooth Castings.
Large Ovens.
Try a Sample.

Write for Catalogue and Discounts.

BRAND STOVE CO., Milwaukee and Chicago.

THREE SPECIAL MONEY-MAKERS.



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ENTIRELY NEW. **IT LEADS THEM ALL.**

Thousands of these booked for this fall's trade, and still they come.

Driftwood and Elmwood Air-Tights.

THE BEST AND MOST POPULAR MADE.

ROSEMONT RADIATORS.

None Better. None So Good.

SAVE TIME,
SAVE FUEL,
SAVE WARMTH,
SAVE MONEY.

WRITE FOR FULL PARTICULARS.

FLOYD, WELLS & CO., Royersford, Pa.

THE ECONOMY ADJUSTABLE FIRE BOX PARTITION

FOR STOVES AND RANGES.

SAVES ONE-HALF THE COAL.

Pa'ented in the United States and all foreign countries.

This device divides the fire box in the middle, thereby confining the fire to one-half the space usually occupied, and **SAVES 50 PER CENT. OF THE FUEL.**

It can be easily adjusted to all cook stoves or ranges, having fire box of any width or length and either perpendicular or angling walls.

It can be quickly inserted or withdrawn, even when the fire is burning.

Additional bottom draft is provided for the fire, thus insuring perfect combustion.

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A sample partition sent by express prepaid to any part of the United States for $2.

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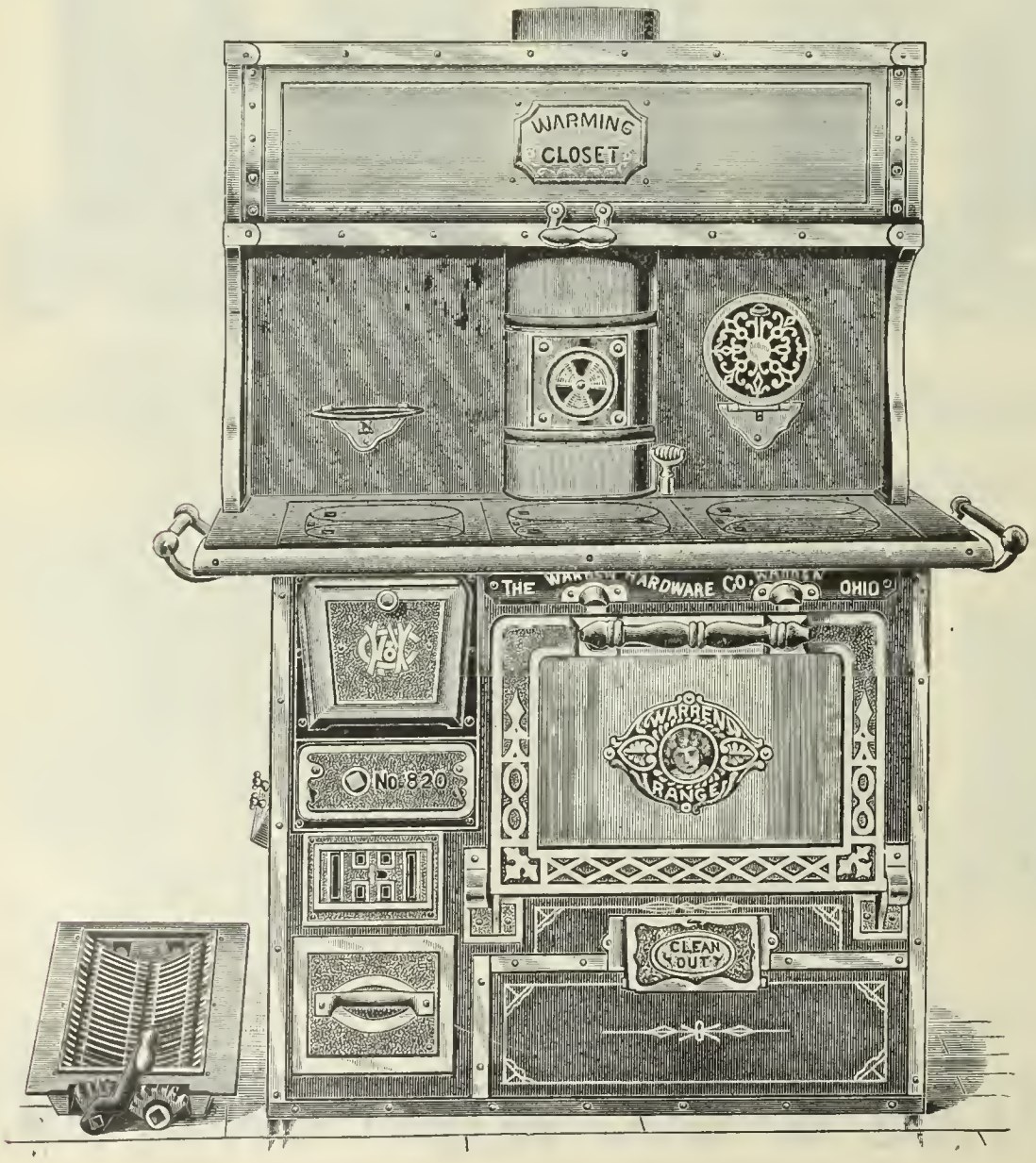

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Made in 16 Sizes.

126 Different Styles.

Substantially built. Heavy in construction. Elegantly finished and fully guaranteed. The line to handle, as they are strictly first-class and up to date. Get our prices, which will interest you. Write for catalogue, which will be gladly furnished.

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Warren Hardware Co.

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16 STYLES OIL HEATERS

now ready. Possess all the advantages of long experience (1844 to 1897) in the manufacture of lamps. The name MILLER is a guarantee of quality. Send for our catalogue No. 57, just out, and see the styles. Many new features.

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THE DEALER

Wishing to Supply only the Best should Acquaint Himself with

THESE PRODUCTIONS.

ECONOMICAL,
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A REPUTATION OF THIRTY YEARS.

RICHMOND STOVE CO., NORWICH, CT.

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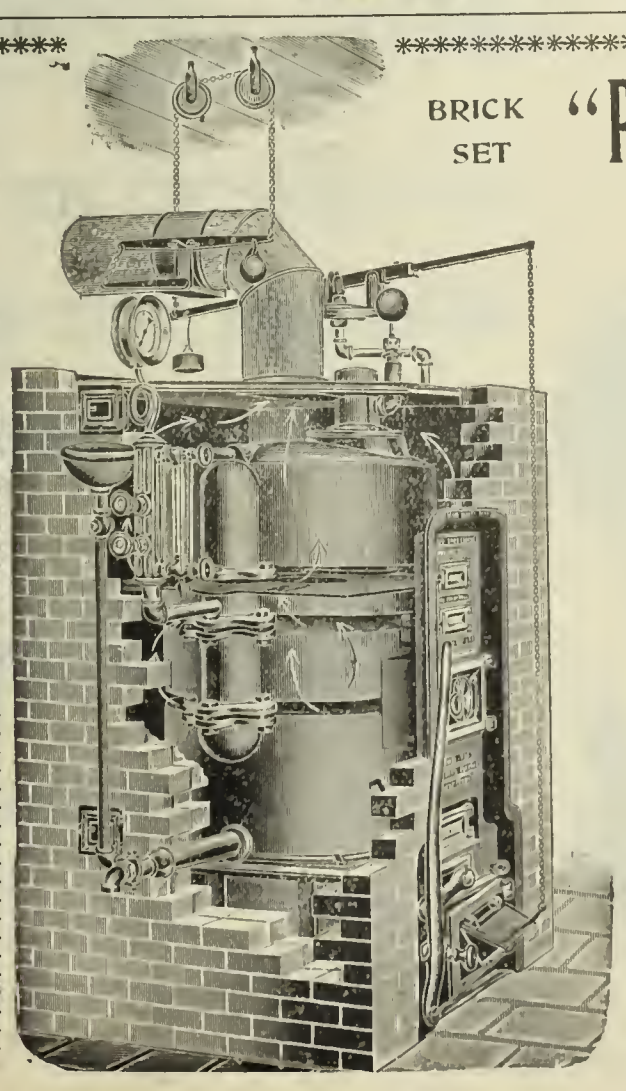

BRICK SET "Plummer" STEAM HEATER "New Model."

Cut shows Boiler and how it is put together, from Ash Box to Steam Dome. Arrows show in which direction fire must travel to reach chimney.

A large amount of available heating surface, which can be easily reached and kept clean, makes it a very *powerful heater.*

Every boiler tested 60 lbs. cold water pressure and warranted free from imperfections. The Plummer has stood the test as an economical and practical *house warmer* for 12 years.

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"Garlands" are always kept ahead of all merit than any other line.

For next grade goods our new line of selling qualities, and are sold at very low

These are so why we are the stoves and range

The Michigan

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MICHIGAN STOVES AND RANGES "Always Dependable" are unequaled for style, finish and prices.

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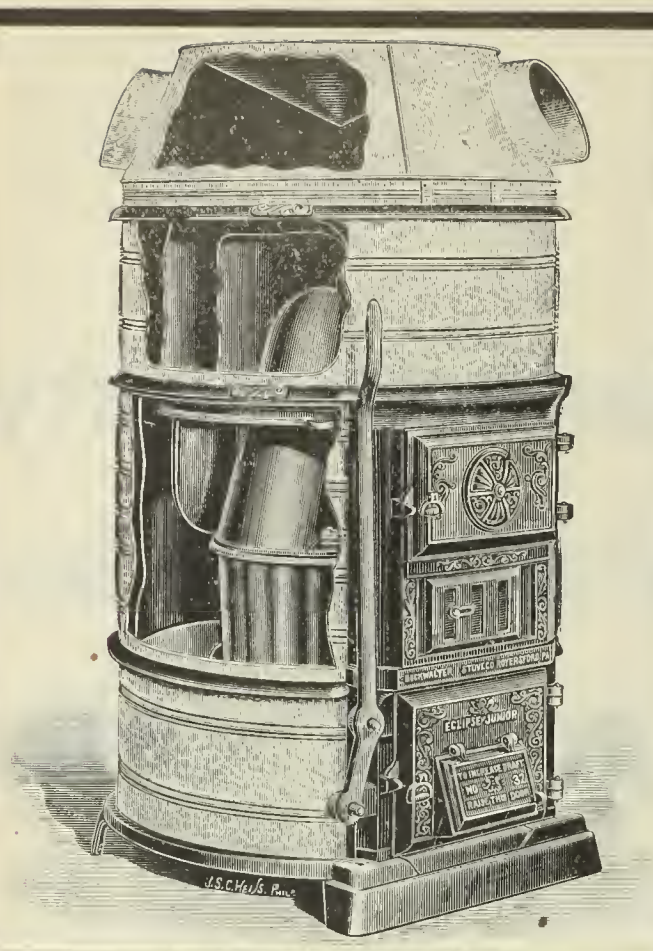
MICHIGAN STOVES AND RANGES "Always Dependable"



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HAS SOME **SPECIALTIES.**

A Furnace Specialty

The Eclipse Junior.

HEAVY CASTINGS.
TRIANGULAR GRATE.
ONE-PIECE CAST DOME.
SELF CLEANING DRUM.

CONTINENTAL STOVES
BUCKWALTER STOVE CO.
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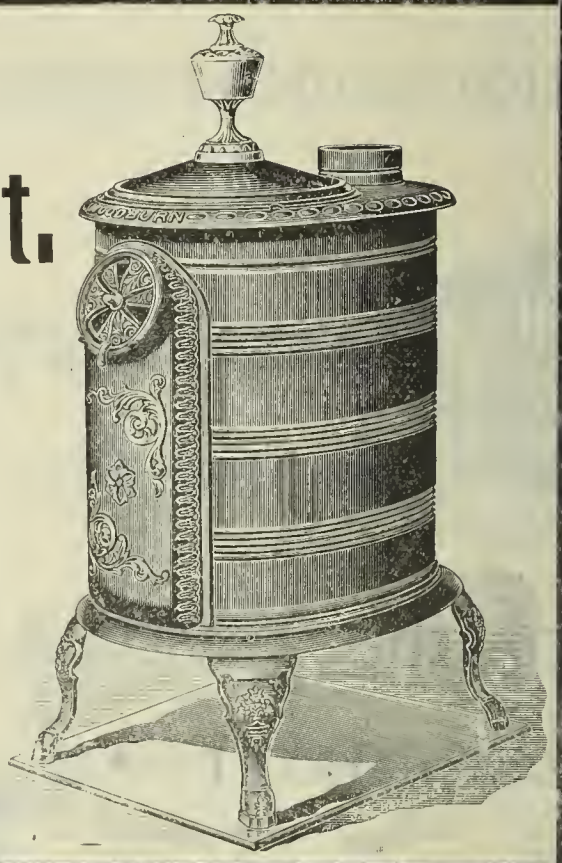
Please the People.

Write for particulars and prices if interested. It's cheap.

A WOOD SPECIALTY,

The "Woodburn" Air Tight.



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Air Flue Outside Gives 3 Inches More Wood Space Inside.

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We make the leading line of Stoves in Pennsylvania.

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A Handsome Line of Sheet Metal Stoves

A Smoke Consuming, Hot Base Coal Air Tight.

The Never Failing Apollo Range.

The All Superior Colossus Heater.

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Please the People.

BUCKWALTER STOVE CO.,
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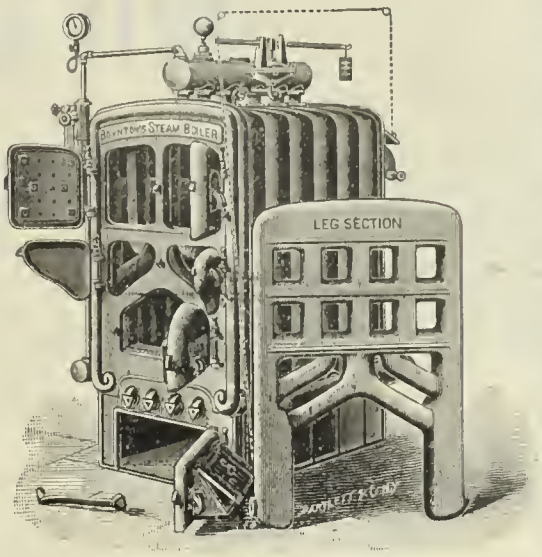
BOYNTON

**HOT WATER HEATERS,
STEAM BOILERS,
FURNACES,
RANGES, ETC.**

BOYNTON'S NEW GAS TIGHT FURNACE.

Remember it is the name BOYNTON we wish you to recall when in want of steam heaters, hot water heaters, furnaces, ranges, etc. Our goods are for sale by best dealers all over the country.

Send for Catalogue and Prices.



BOYNTON'S STEAM BOILER

The Boynton Furnace Co.,

207 and 209 Water St., New York.

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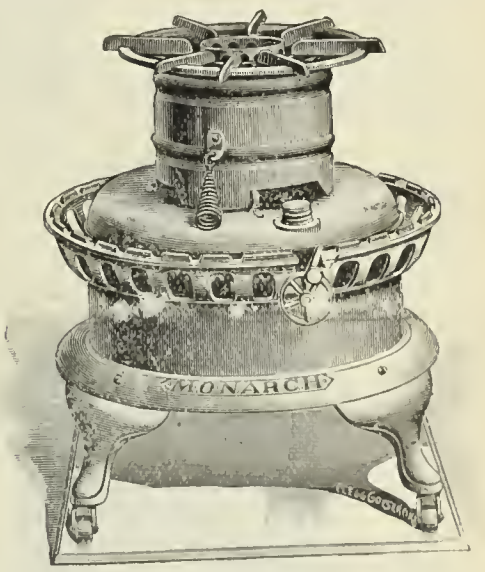
Monarch Blue Gas Flame Oil Heating Stove.



The phenomenal success of the "Blue Flame" oil burner of the past two years has created a "Macedonian Call" for a heater made on the same lines, and the "Monarch" steps foward to supply the demand. It has been on the market one year, and for the season of 1897-8 is presented with several important improvements which a year's experience has suggested and we offer it with all confidence in its efficiency, cleanliness, intense power and great comfort.

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The Monarch Stove Co., Mansfield, Ohio.

Gentlemen:—Last year I bought an Oil Stove from you, and now want a new wick.

The Stove has given the best of satisfaction, is perfectly safe, and the best of it is, it furnishes lots of heat and no smoke or odor whatever. It is a gem and a success. We used it all last winter.

Yours respectfully,
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ROYAL HEATERS.

All Kinds of Heating Apparatus.

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Royal Heaters Lead All Others.

Sold on their Merits, not on their Antiquity.

Clermont Oaks

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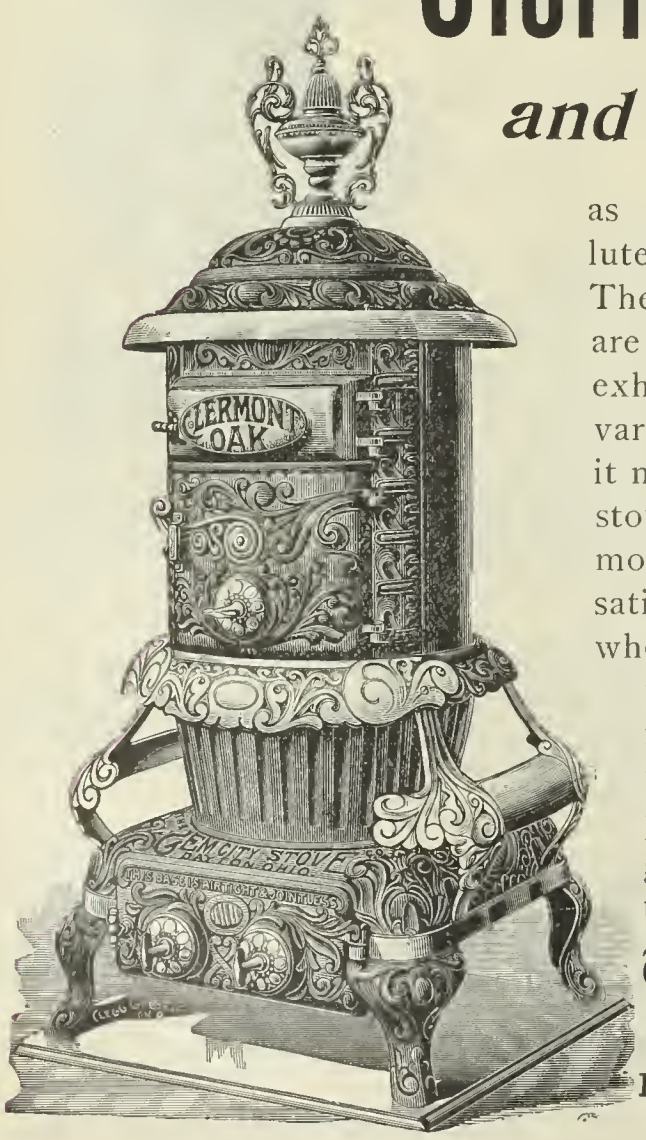
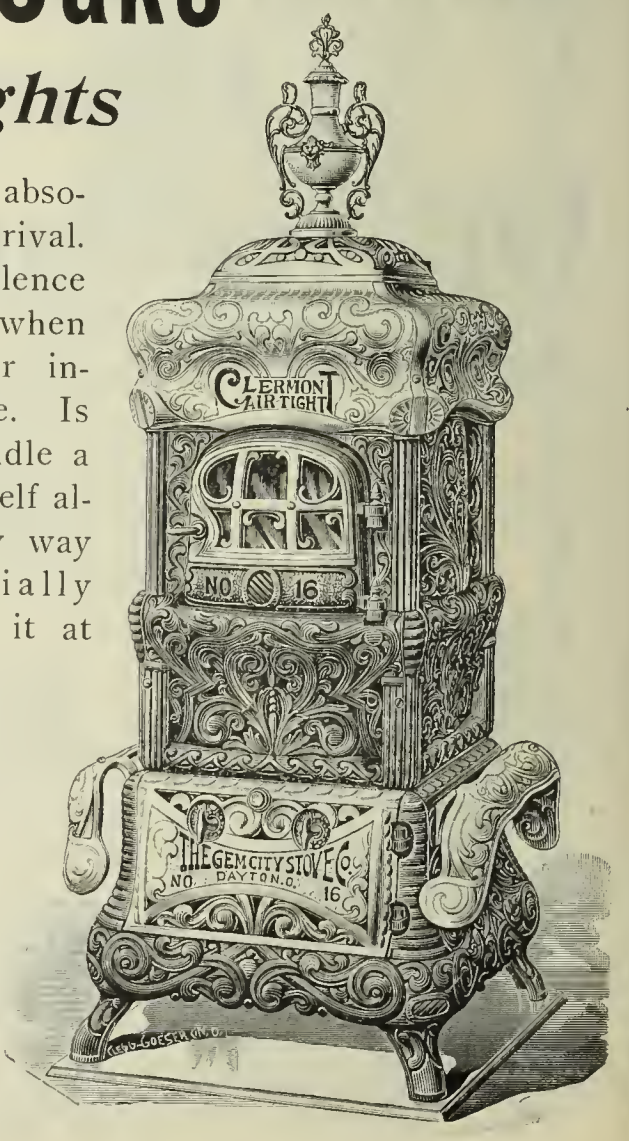


as made by us are absolutely without a rival. Their points of excellence are so manifest that when exhibited the dealer invariably makes a sale. Is it not better to handle a stove that sells itself almost and is in every way satisfactory, especially when you can sell it at the same price as inferior productions? Our complete line is a good one to tie to. Write

The Gem City Stove Co.,
DAYTON, OHIO,
To-day.



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A
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WITHOUT A PEER.

TWO SERIES, { Series A.—Medium Price. Series B.—Low Price.

SIX SIZES, . . . { 16 x 20 18 x 20 20 x 20 16 x 22 18 x 22 20 x 22

ALL STYLES, { Write for Steel Range Catalogue No. 14.

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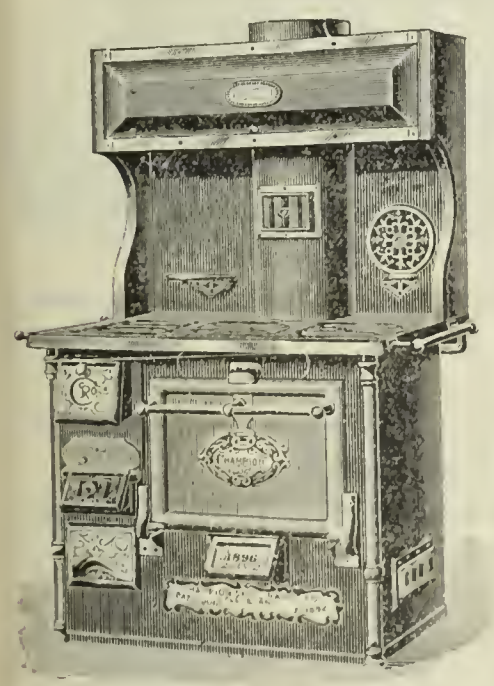

They are Wealth Producers.

Stoves were formerly considered luxuries. To-day people want something MORE SUBSTANTIAL and

The Champion and Marquart
STEEL RANGES
are the apple of their eye.

GET IN ON THE GROUND FLOOR AND PUT IN A LINE.

EASIEST SELLER YOU EVER SAW.

When once introduced will sell themselves.

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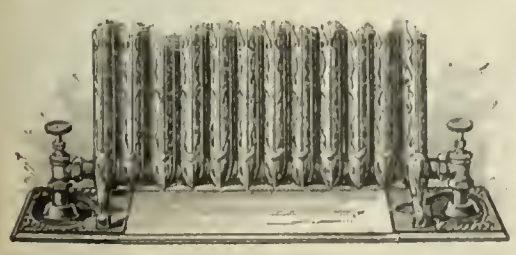

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A thoroughly practical device to finish under Radiators to assist steam fitter in making nice work.

Protects Floors, Carpets and Ceilings from Heat and Leakage.

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A SELECTION OF
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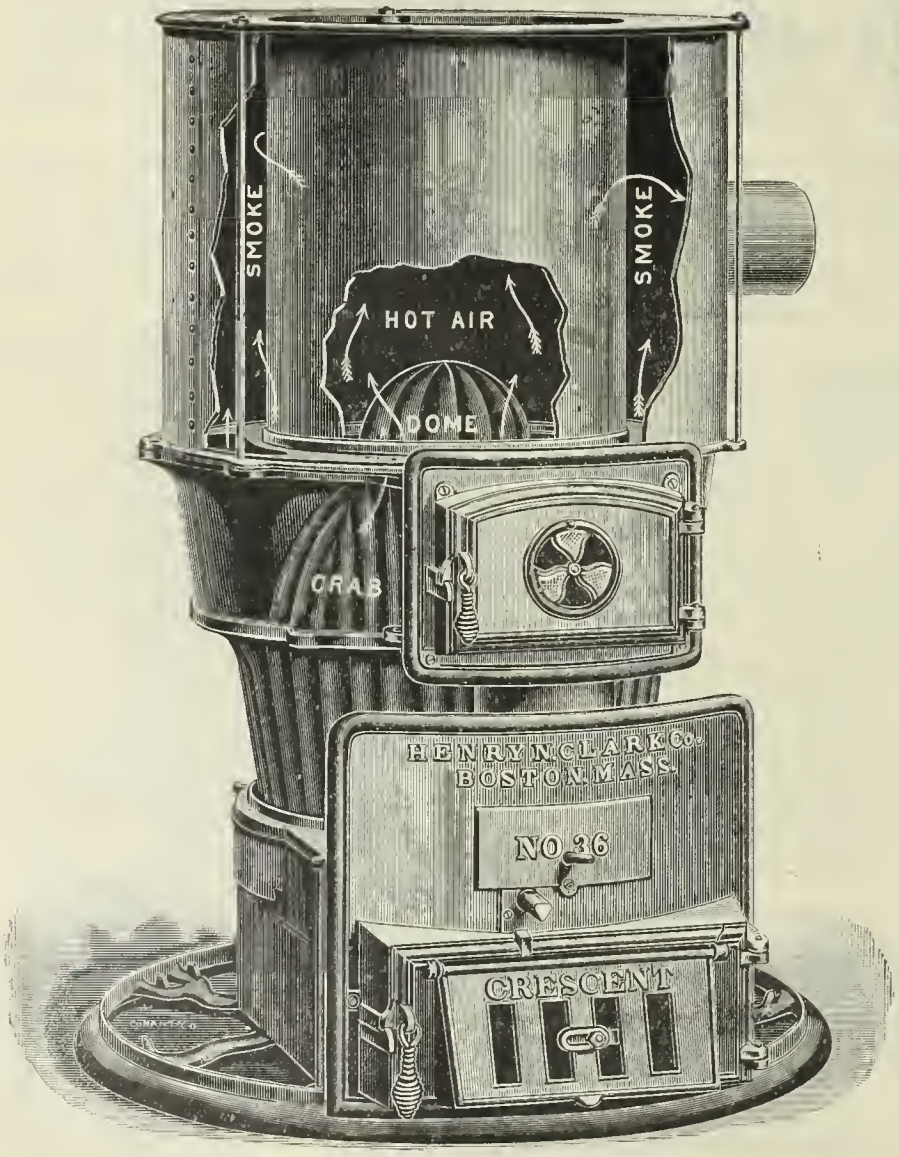

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THE HENRY N. CLARK CO.,

Crescent Furnace.

Strong Points and Special Features:

It is a quick **Powerful Heater** of good weight and carefully made.

The **Radiators** are of the best steel with cast iron top and bottom.

The **Joints** are **Cup** Joints easily packed and perfectly air tight.

The **Ash Pit** is **Deep** and **Roomy** and the grate can easily be removed through the ash pit door.

The **Casing Rings** are made to carry an inner casing if desired.

The **Grate** is of the **Eclipse Duplex** pattern and is the best and strongest grate ever invented.

It is constructed on the very latest scientific principles of combustion.

It has a **Dust** flue and **Water** pan.

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No. 36 has a 21-inch Fire Pot.

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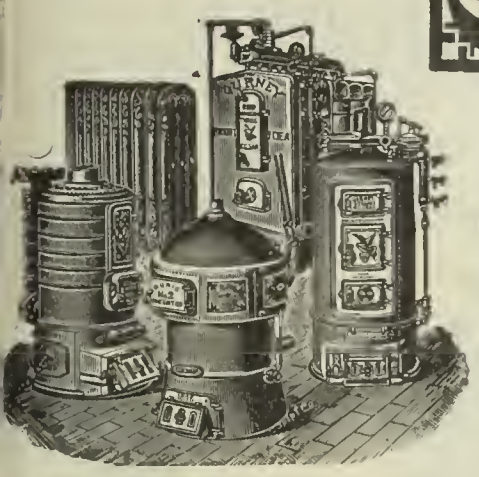

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THE STANDARD OF THE WORLD.
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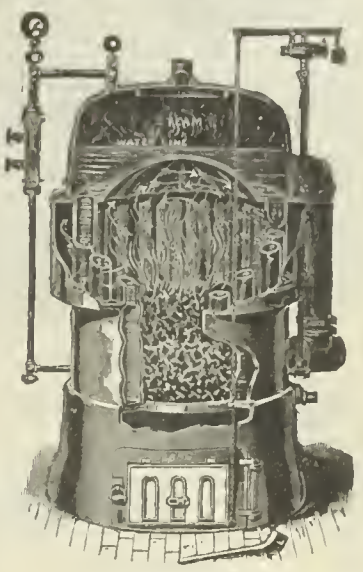
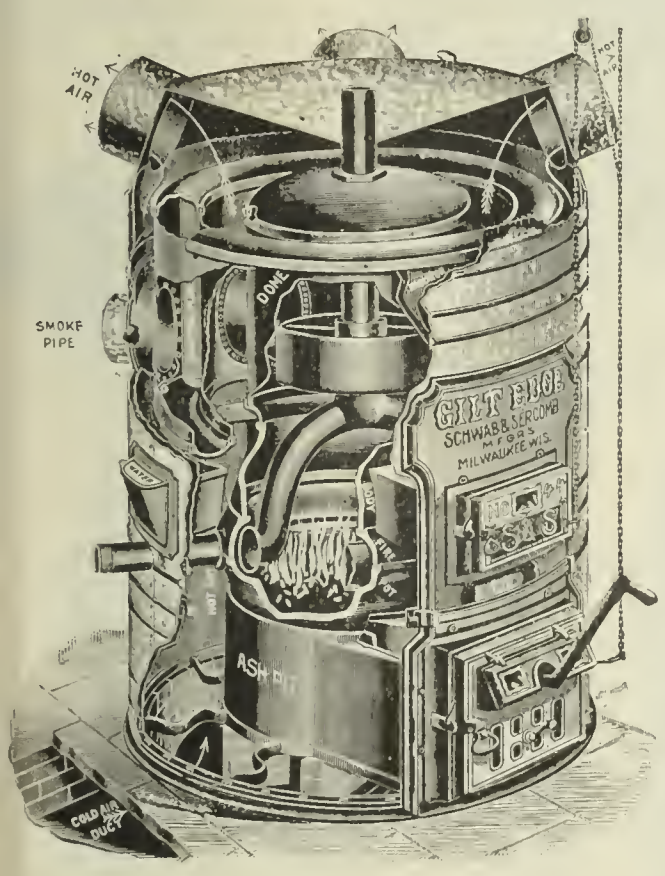


SECTIONAL VIEW.
DORIC SEAMLESS TUBULAR
STEAM BOILER.



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COMBINATION WARM AIR & HOT WATER HEATER
IS NO EXPERIMENT.

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Write us for Illustrated Circulars and Catalogues.

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GENTLEMEN :—The combination hot air and hot water heater that you placed in my residence in the fall of 1896 is perfect in its operation and entirely satisfactory in its heating results. There are nine hot water radiators and ten hot air registers, making a perfect distribution of heat. You may refer anyone to me for the strongest endorsement of this system. Yours very truly, J. M. LONGNECKER.

We make Warm Air Furnaces adapted to any fuel or climate.

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E. E. DUNNING.
Manager Heating Department.

MILWAUKEE, WIS.

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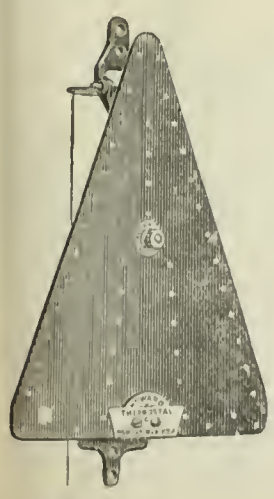
PLATE



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QUICK And Gradual ACTION.

No "FLIP-FLOP" from one *extreme* to another.

IT REGULATES WITHIN A DEGREE.

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- DRAFT
- REGULATOR.

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The *DAMPER* is operated uniformly with the changes in temperature and not opened and closed suddenly. The movement and power is obtained directly from the *PLATE*. From a normal position to wide open or closed, the change is

BUT ONE DEGREE Fah.

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FOR

HARD COAL, SOFT COAL AND NATURAL GAS.

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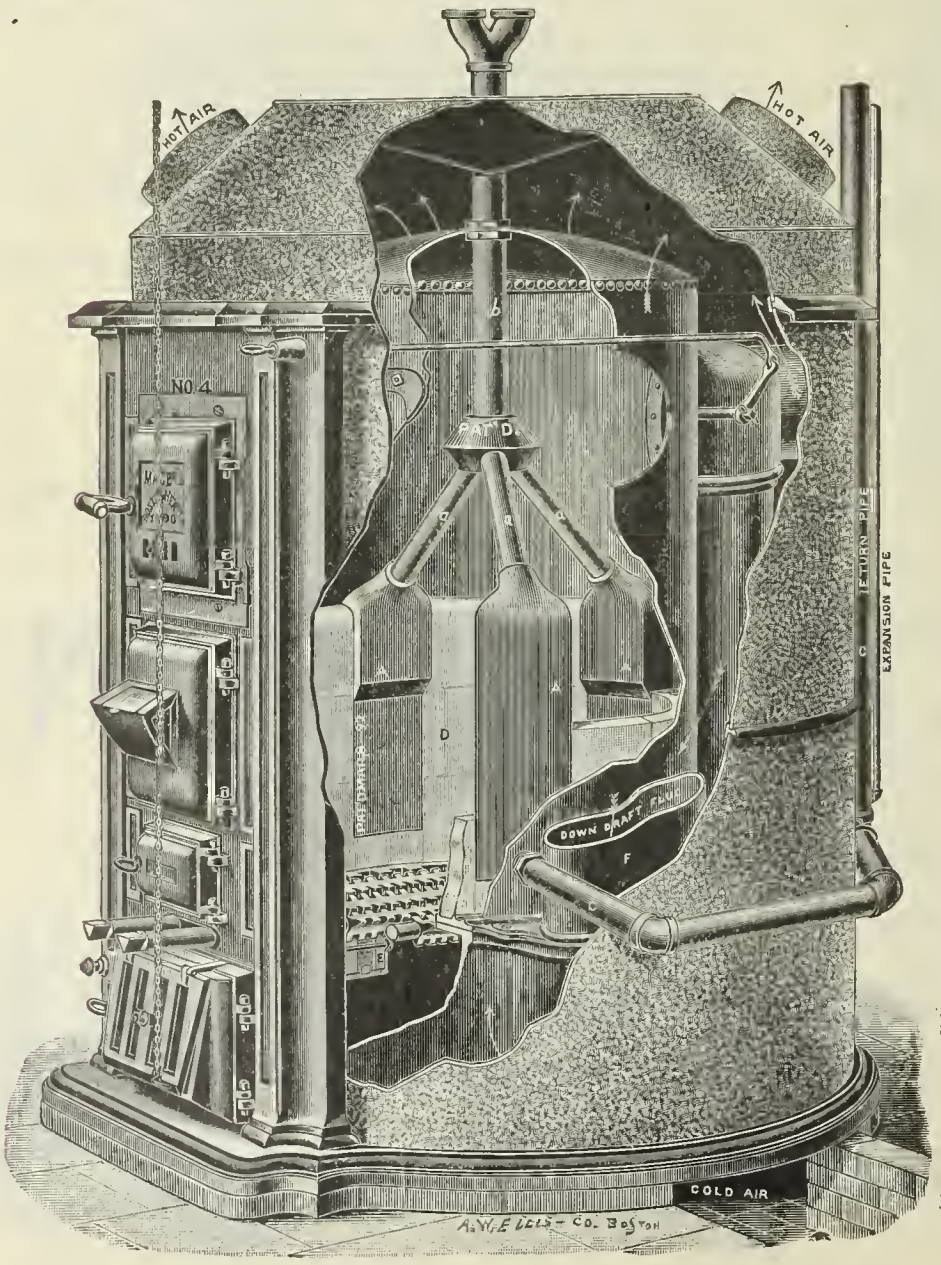

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Warm Air AND
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Sizes, - - - 1, 2, 3, 4, 5½ and 7.

With hot water capacity from 75 to 700 square feet of radiating surface. . .

To those whose customers demand PURE, as well as WARM air, our combination system will be found a source of PLEASURE and PROFIT. Those who are not familiar with the methods best adapted for their purpose may freely ask us to advise.

REMEMBER the name "MAGEE," and that we have a full and complete line of Ranges, Furnaces, Combination, Hot Water and Steam Heaters, fully warranted.

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THE VERY BEST.
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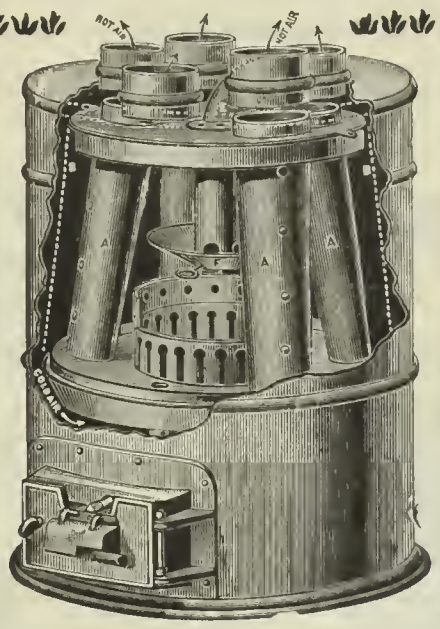

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WILL DO IT.

The public are not asleep, and when any decided improvement is placed at their disposal they soon show their approval, as our past sales of the Positive show, and our encouraging orders for 1897 from firms who set the Positive in 1896, being the first year it was put on the market.

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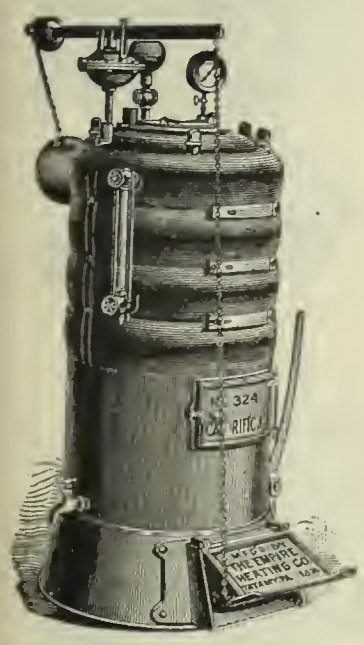

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For low pressure steam and hot water heating they have no superior. More good points than any other heater on the market. Excellent heating surface, the best grate arrangement out. It is economical, durable and convenient. Made in a large variety of sizes, suitable for all purposes. From the smallest to the largest job. Write for illustrated catalogue and prices and discount to . . . .

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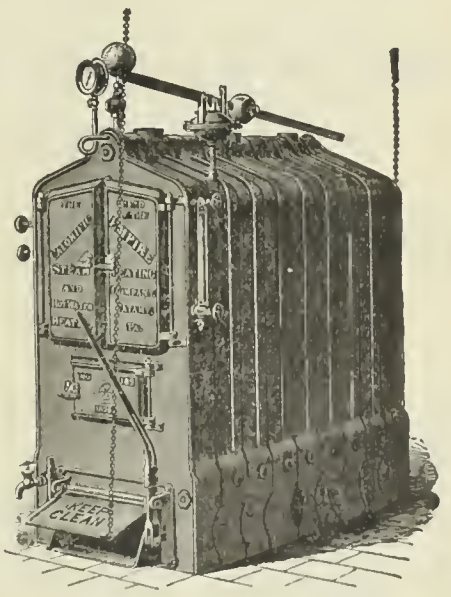

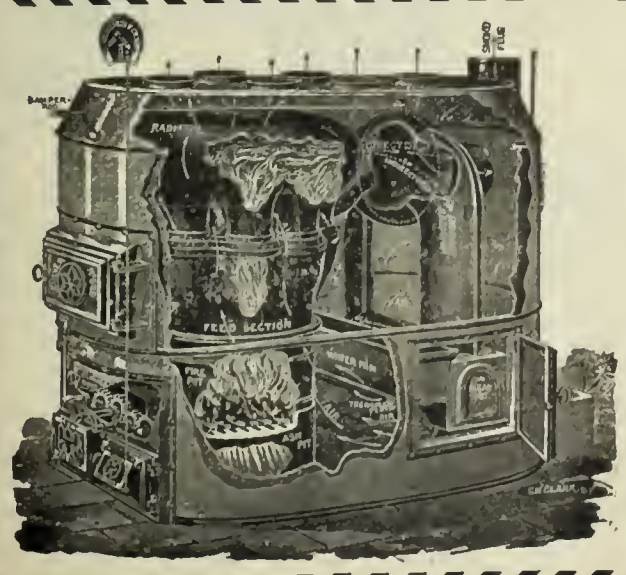

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Double and Single Oven Ranges, with special features and latest designs.

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Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

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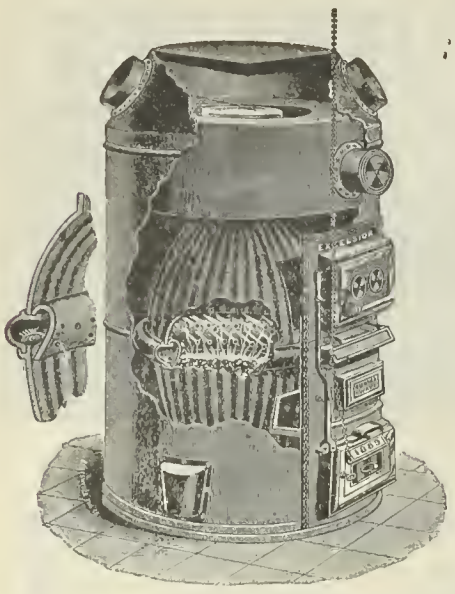

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ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
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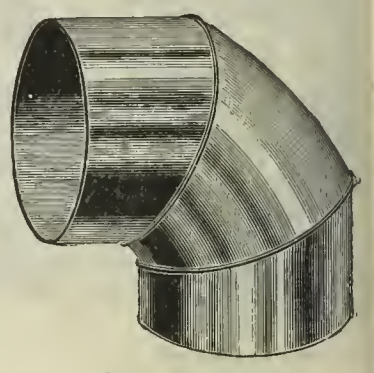
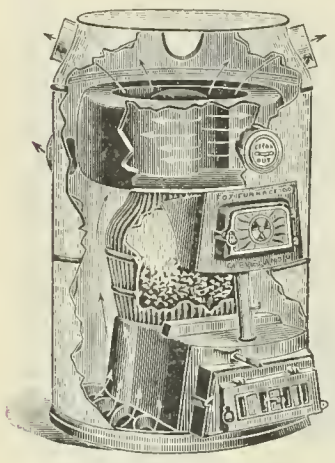
See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.



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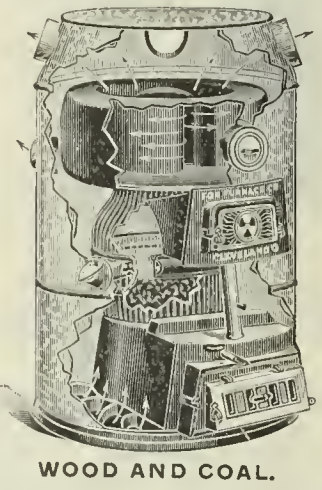
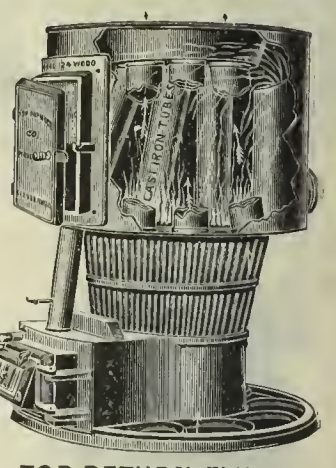
Send us a postal request for prices and other information with regard to our line.



WOOD AND COAL.



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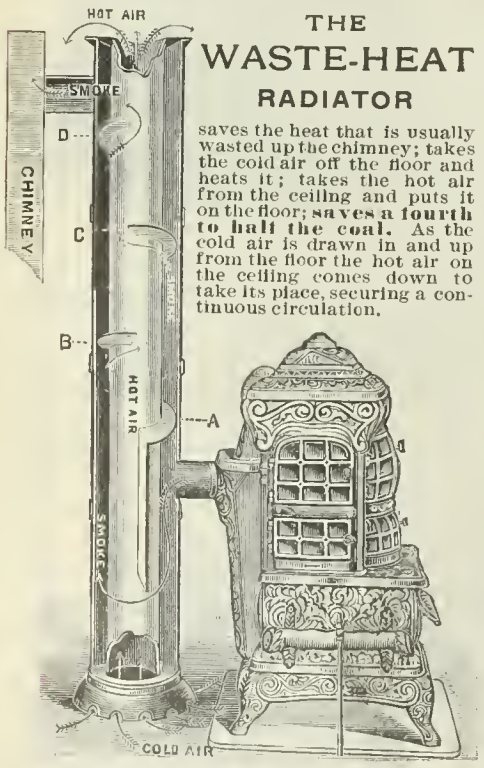


THE
WASTE-HEAT
RADIATOR

saves the heat that is usually wasted up the chimney; takes the cold air off the floor and heats it; takes the hot air from the ceiling and puts it on the floor; **saves a fourth to half the coal.** As the cold air is drawn in and up from the floor the hot air on the ceiling comes down to take its place, securing a continuous circulation.

The Waste-Heat Radiator Attached to a Stove.

TO STOVE AND FURNACE DEALERS:

DEAR SIRS:—The Waste Heat Radiators have been in use in Minnesota and other parts of the Northwest, where the thermometer often registers thirty to forty degrees below zero, for the past three years and have been thoroughly tested, so they are no experiment; but until within the past few months, they have been made only in a limited way, as each one had to be made to order owing to the difference in the height of the collars on different stoves and furnaces, but now we can make them with sliding collars and that they can be adjusted to fit any stove or furnace, therefore can make them in large quantities and do a general business in them.

The following people have used them during the past two or more years, to any of whom we refer: W. W. Rand, Sec'y Minneapolis Gas Light Co., Minneapolis, Minn.; J. C. Oswald & Co., Minneapolis, Minn.; Wm. Cunningham, St. Paul, Minn.; R. A. Lanpher & Co., St. Paul, Minn.; M. M. Gasser Co., Duluth, Minn.; W. W. Schiffman, Duluth, Minn.

The letter printed herewith from Mr. Clifford Hubbell, Cashier of the Columbia National Bank, Buffalo, N. Y., speaks for itself.

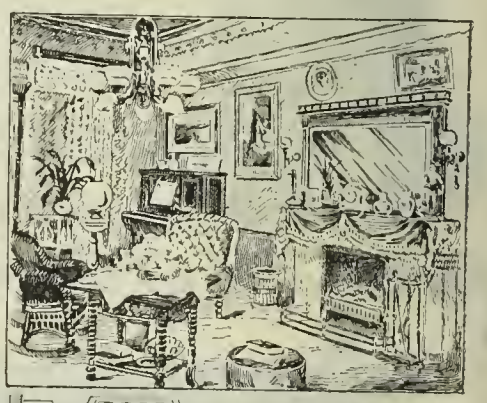
COLUMBIA NATIONAL BANK OF BUFFALO.
JOSIAH JEWETT, President.
CLIFFORD HUBBELL, Cashier.

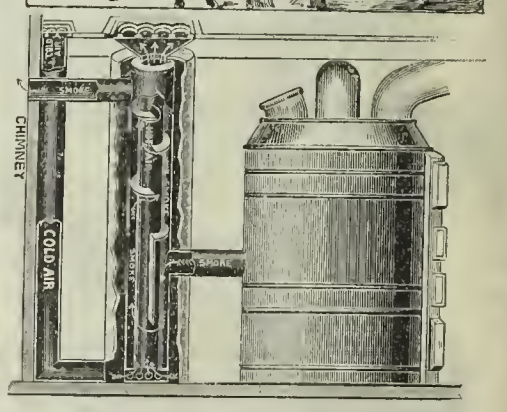
BUFFALO, N. Y.

DEAR SIRS:—Regarding the Waste Heat Radiator which you placed in my residence, No. 71 Highland Ave., I have to say that it has worked admirably. I believe that the furnace burns 25% less coal now than formerly, and I think that that percentage is a very low estimate. In my mind the greatest advantage is that it draws the cold air from that part of the house where the cold air most accumulates, and makes the temperature in the rooms much more even, conducing thereby to comfort and healthfulness. I know that my wife, being skeptical about patent inventions of any kind, before this was put in, has come to acknowledge that this accomplishes the purposes for which it was purchased: viz., to save a large portion of the waste heat that goes up the chimney, and to save in the amount of coal burned, and make the temperature more even.

Yours respectfully,
CLIFFORD HUBBELL, Cashier.

In order to introduce our Radiators we will send one to any reliable Stove or Furnace Dealer and if he finds it as we represent it then we want him to buy it and take the exclusive sale of them in his city; otherwise to hold it subject to our order. Yours truly,





The WASTE-HEAT RADIATOR attached to a hot-air furnace; attaches to steam and hot-water boilers in the same way.

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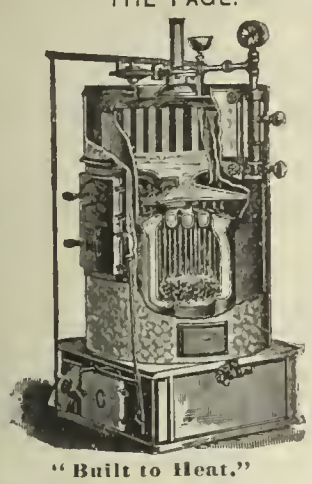
WASTE-HEAT RADIATOR CO., BUFFALO, N. Y.



"Built to Heat."

SPEAKING OF MAN.

Even the "new woman" admits he is "a good thing to have in the house."

SPEAKING OF BOILERS,

The new and up-to-date Steam Fitter must admit that the

"PAGE"

is a "good thing" to have in *any* house. Users say so—***they ought to know.***

WHY NOT CORRESPOND?

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THE COMBINATION HOT WATER HEATER

— FOR HEATING —

HOUSES, STORES, CONSERVATORIES and BATH ROOMS

by the combination of hot air and hot water if desired, or hot water alone.

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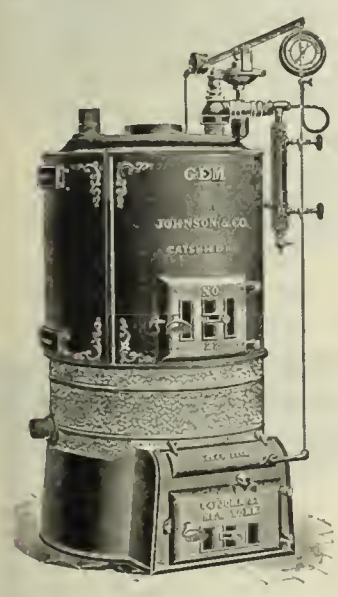

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STEAM AND HOT WATER HEATER.

Steam in this Heater is generated very rapidly at a minimum cost. Waste of fuel is not possible in this construction, as at every point in the course of the draft the heat is absorbed by the water.

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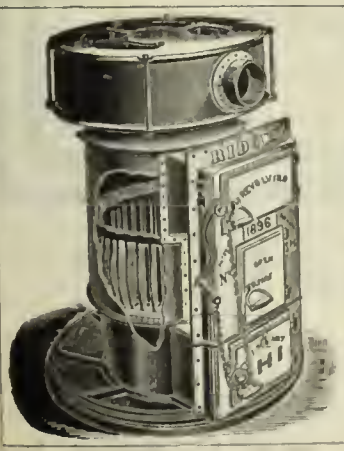

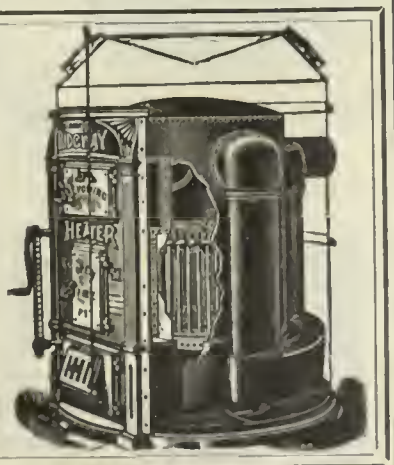

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Prepared for the Steam and Hot Water Heating Course at the New York Trade School, with Supplementary Chapters on House Heating, Specifications and Surface Estimating.

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Plans of various systems are given and a full account of all the details of a successful heating job.

CONTENTS.

Chap 1. Tools, Fittings and Pipe.
" 2. General Questions on Heating.
" 3. Low Pressure Steam.
" 4. Two-Pipe Steam Heating.
" 5. Single Pipe Low Pressure Steam Heating.
" 6. Indirect Steam Heating.
" 7. Hot Water Heating.
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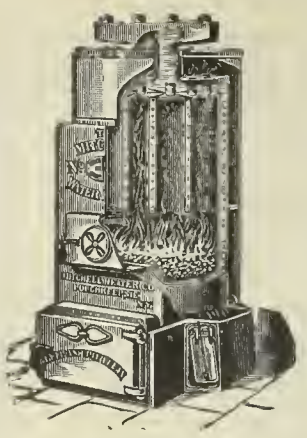

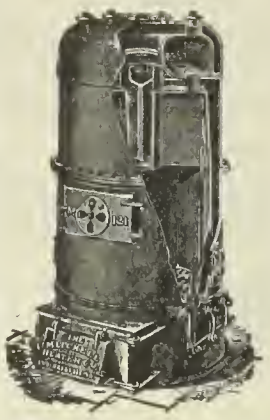

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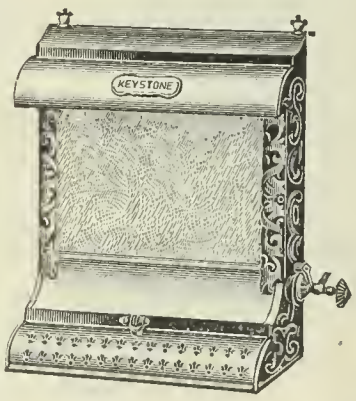

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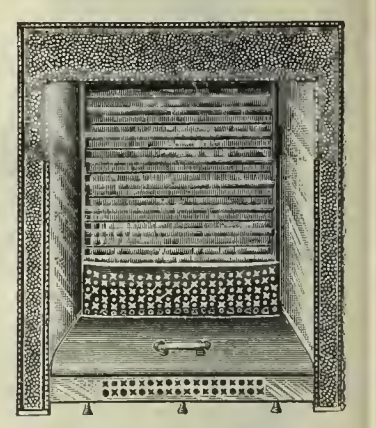

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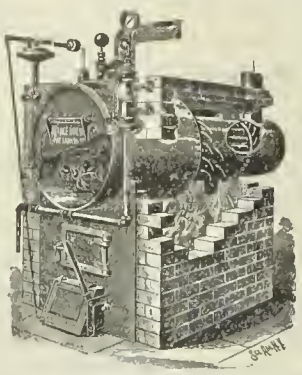

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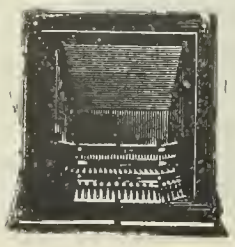

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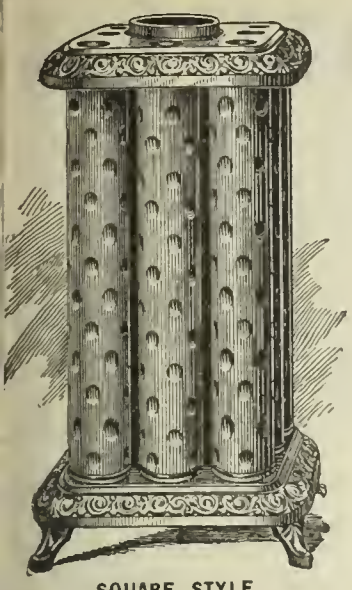

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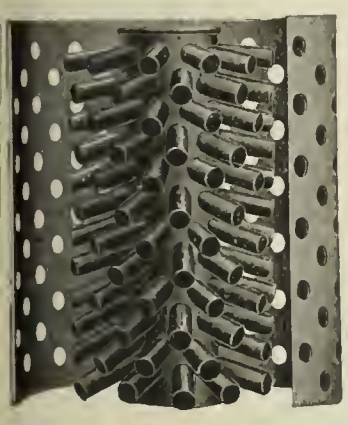

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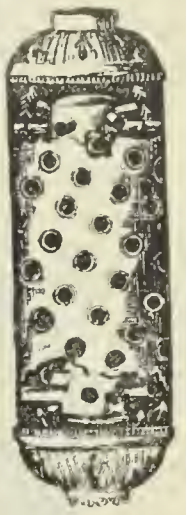

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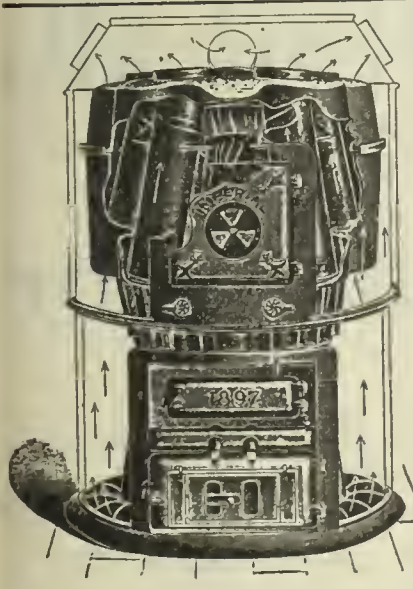

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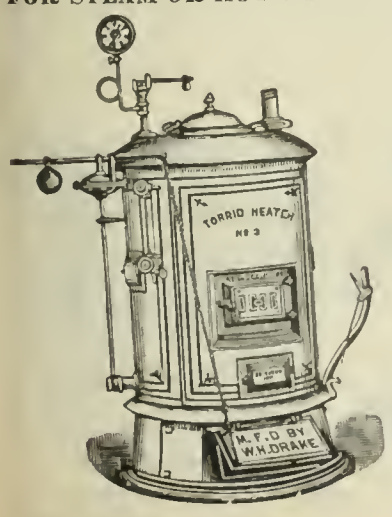

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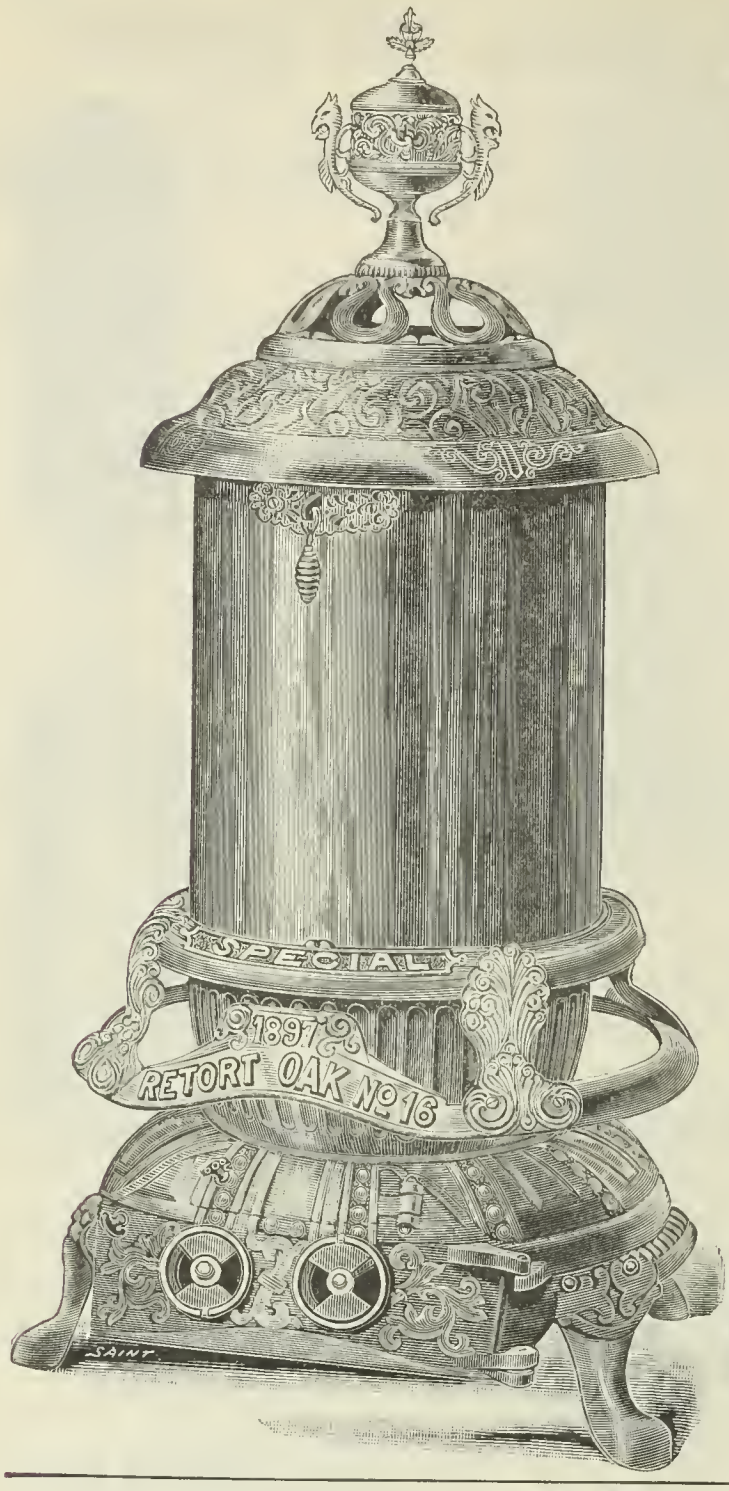

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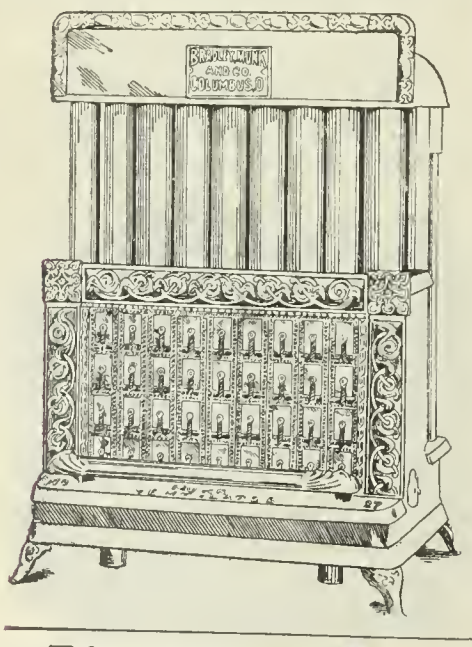

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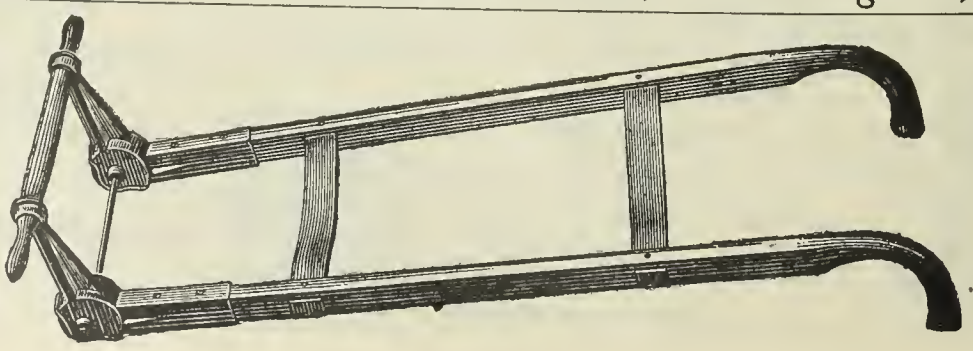

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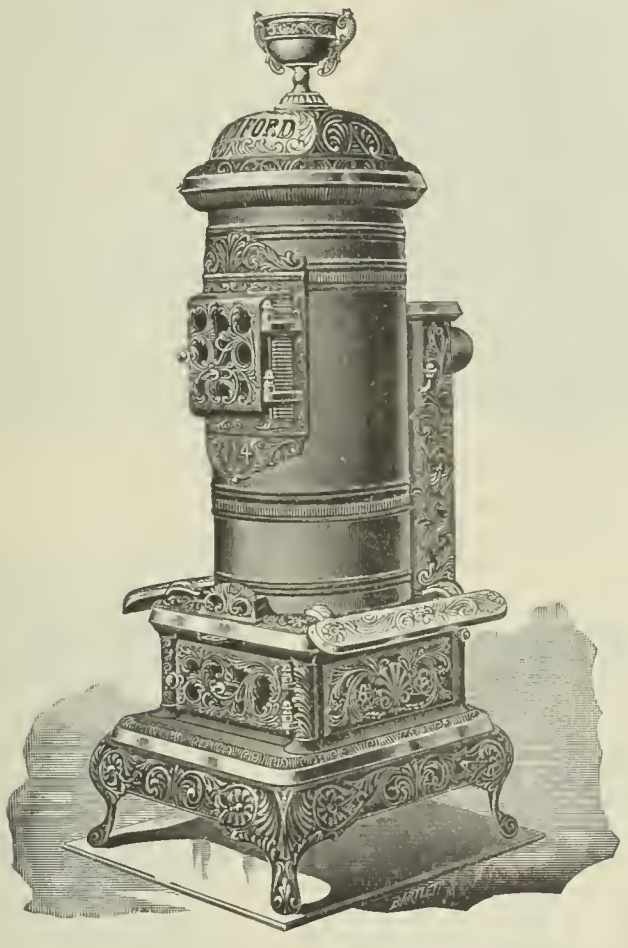

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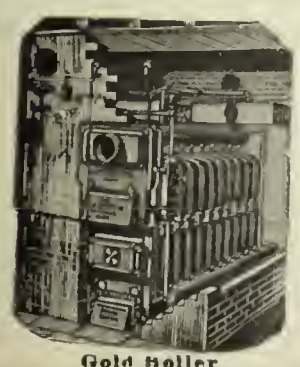
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Laying Out Pipe,
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Piping the Building,
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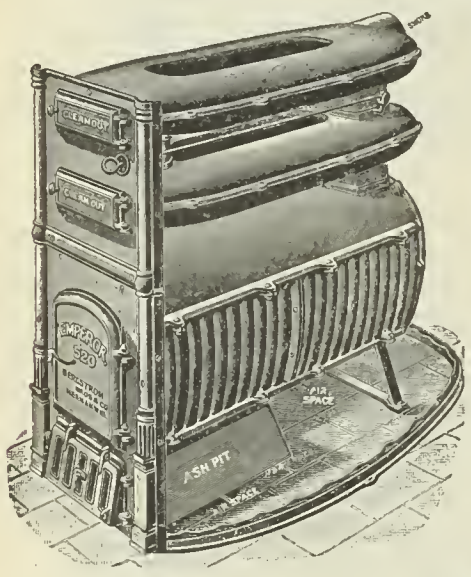

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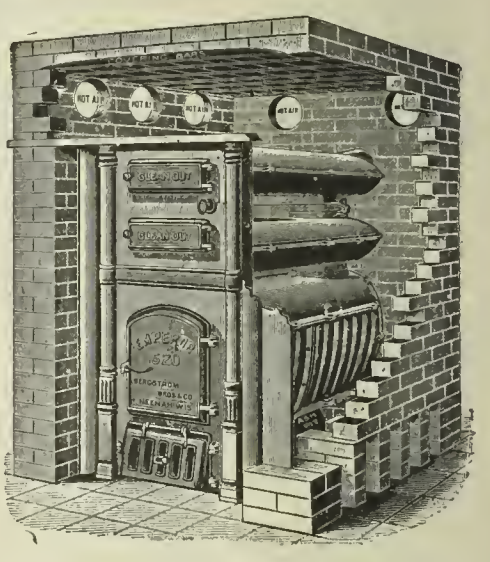

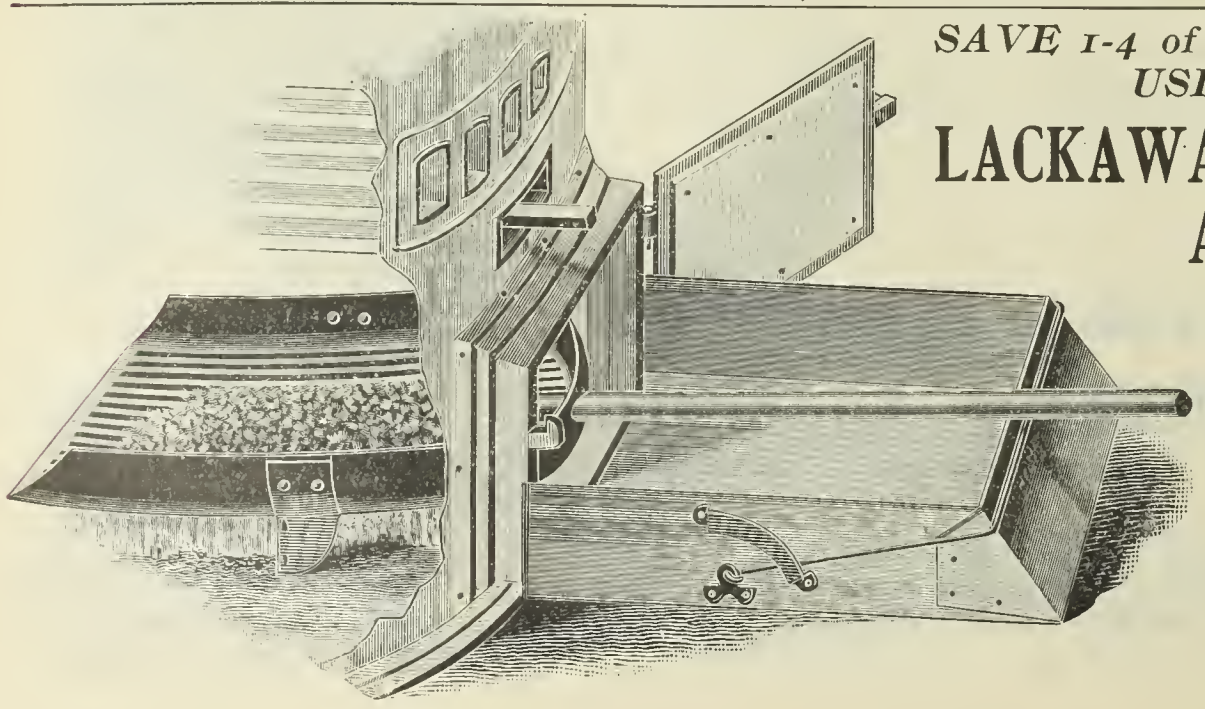

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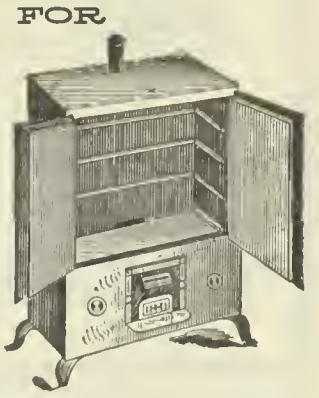

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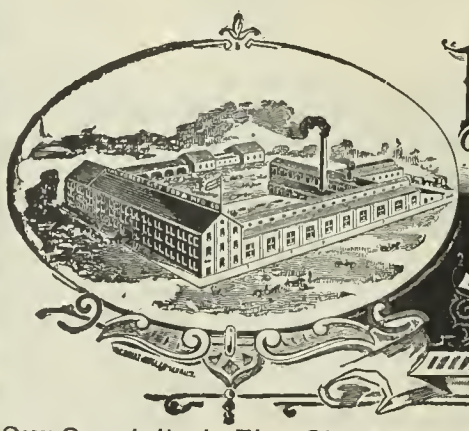

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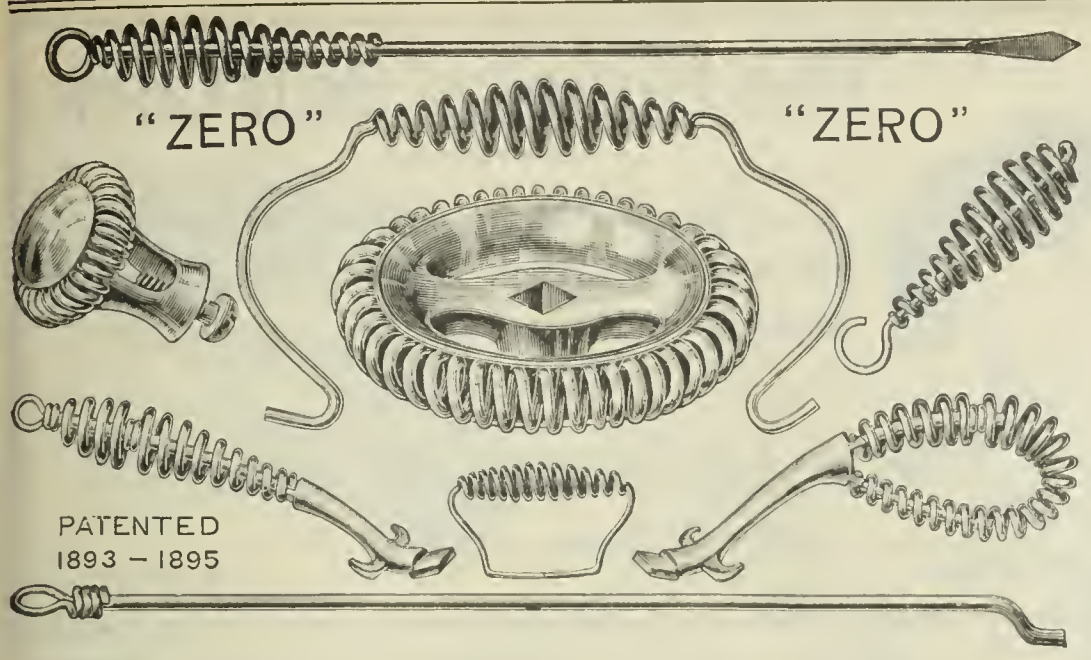

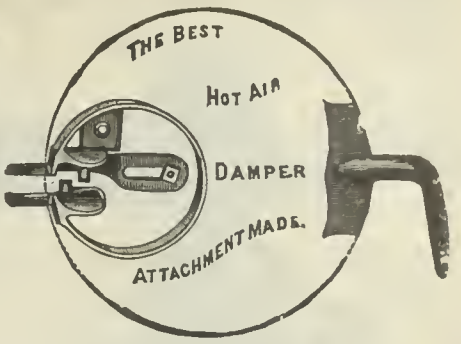

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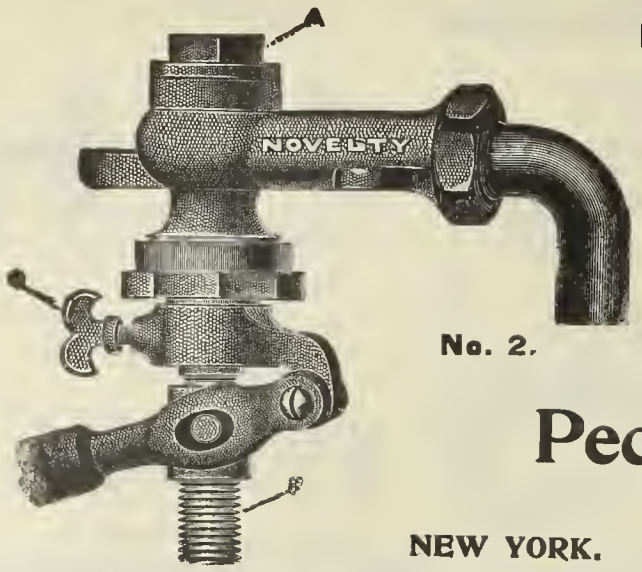

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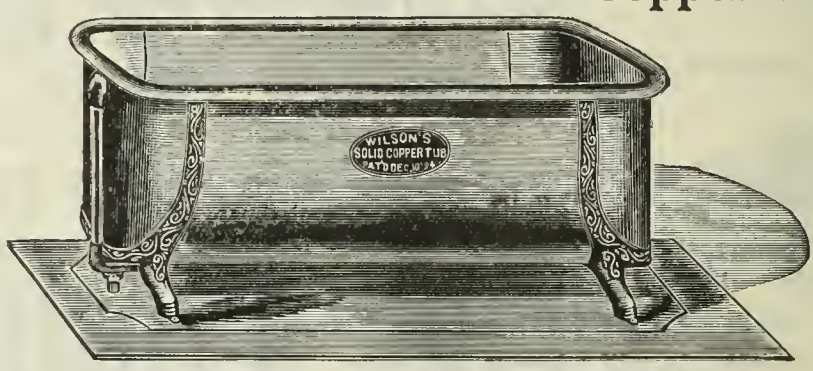

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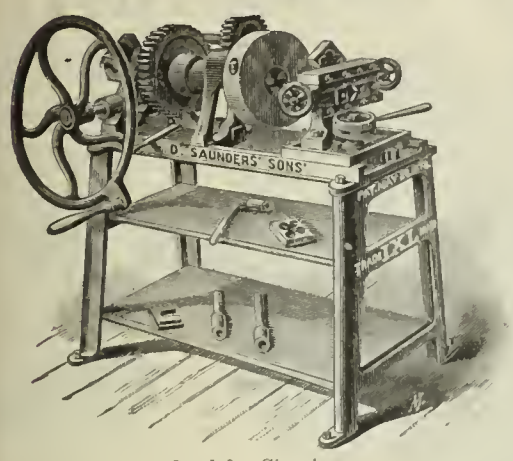

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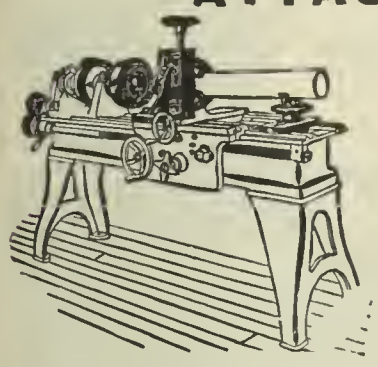

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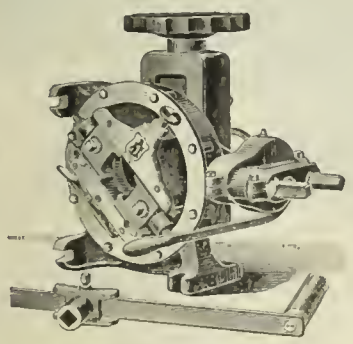

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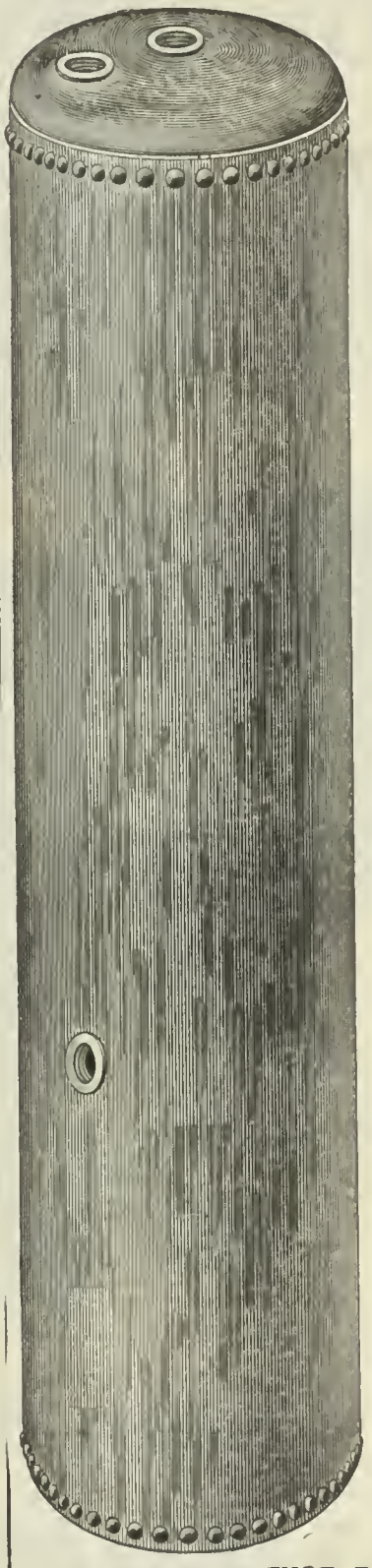

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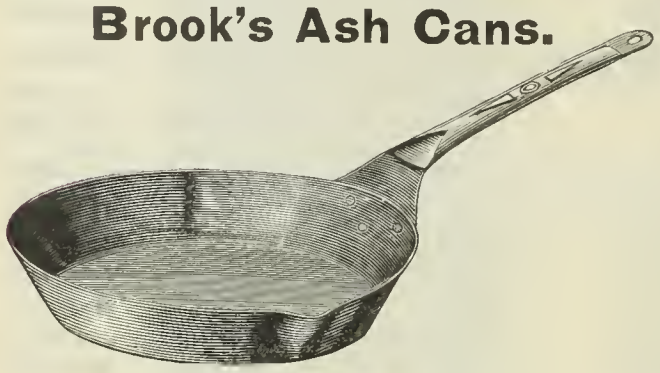

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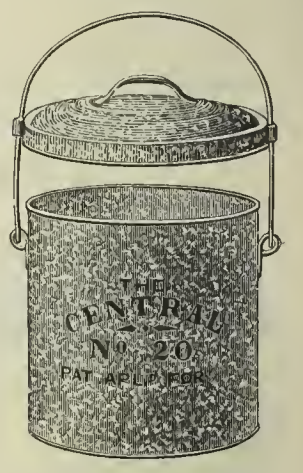

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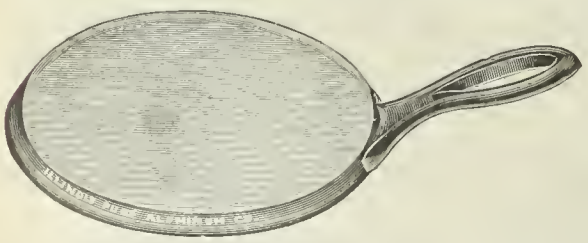

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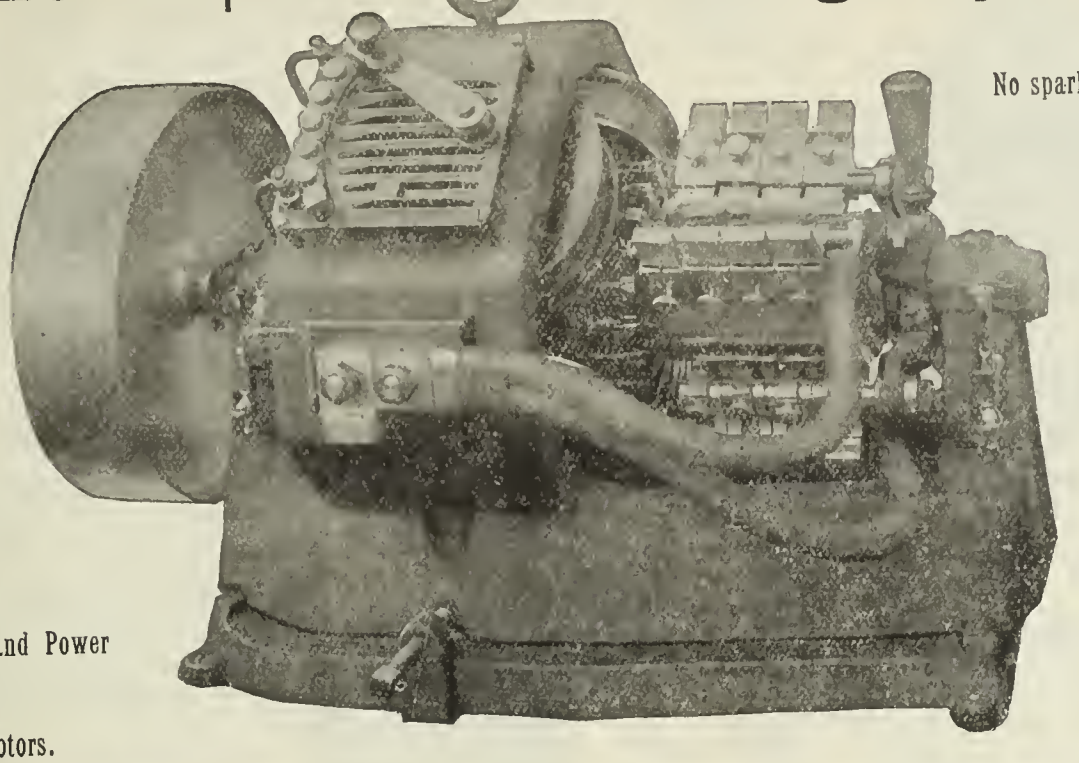

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THIS book is brought out to meet the needs of a body of sheet metal workers whose trade has never before been thoroughly described. The author acquired proficiency in copper working through a long apprenticeship and many years of actual labor at the bench. The instruction he gives is, therefore, entirely practical, and will be correspondingly valued by those who are in any way interested in coppersmithing. A special feature of the work is the illustrations, of which there are nearly 500, and which add much not only to the interest but to the value of the text, as they show the work in all stages of progress and illustrate all the appliances, patterns and tools. The work is divided into sections, each treating a separate topic, and is thoroughly indexed. The style of the writing is exceedingly simple, and the descriptions of work go into the smallest details, a fact that will be especially appreciated by those who read the book for instruction in this handicraft.

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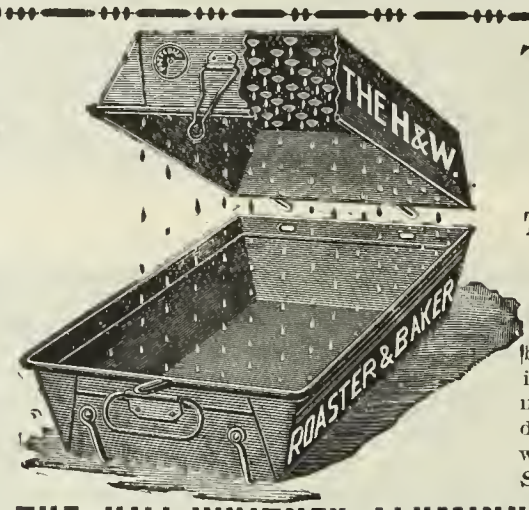

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The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth.

The Dauber is also made of sheepskin, with the wool on, and so shaped as to readily get the blacking into all crevices and corners. It is also adapted to polish russet and patent leather shoes, cleaning windows, furniture, etc.

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—DAUGHTER OF HER FATHER.—A Kansas editor went to Mexico on an editorial excursion recently, leaving his daughter, 17 years old, to get out the paper during his absence. The first issue under the "new woman" regime contained this notice at the head of the editorial column:

"Pa is in Mexico. I received a letter from him this morning. He has got ma with him and is having a good time, I guess. I wish he was home, as it is lonesome to be editor-in-chief all alone. Pa and ma went to church and a bull fight last Sunday. Go well together, pa and ma, church and bull fight.—*Ledger*, Mexico, Mo.

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"ROME" Nickel Plated and Polished Copper

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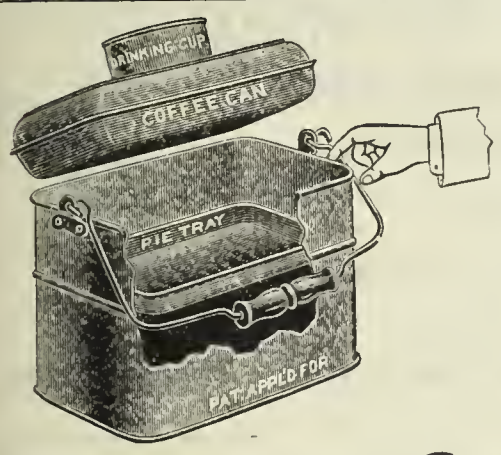

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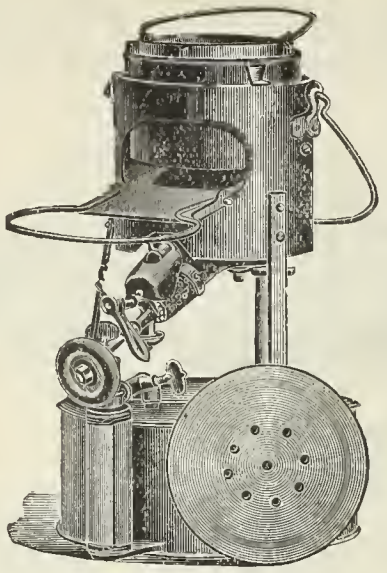

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JOINT WIPING,

FOR BEGINNERS IN PLUMBING.

With thirty-five illustrations; 43 pages.

Paper, 25 Cents.

This book contains a reprint from *The Metal Worker* of two articles on the method of joint wiping, an operation calling for a very large degree of manual skill. The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions. The second account, by an expert joint wiper, is also illustrated from photographs and will prove of great assistance to learners. Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used. The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

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—GOVERNOR DRAKE, of Iowa, in a recent speech, told a new story of a meeting between Lincoln and A. H. Pickering, of Chicago. Mr. Pickering, who is a very tall man, was a resident of Iowa at the time of Lincoln's election, and was engaged in shipping cattle. He and Mr. Drake came to Chicago on business, and, hearing that Lincoln was in the city, they sent up their cards, and were shown to the President-elect's room. "When we got to Lincoln's room," said Governor Drake, in his speech, "he opened the door, and on seeing Pickering asked, 'How tall are you?' Pickering said, 'Six feet four.' 'Why,' cried Lincoln, 'that's my height. Let's measure.'" And then the President of the United States and the cattle-shipper stood back to back, while the first lady of the land, Mrs. Lincoln, who was a little woman, after standing on tiptoe and reaching to the tops of their heads, decided that it was a tie.

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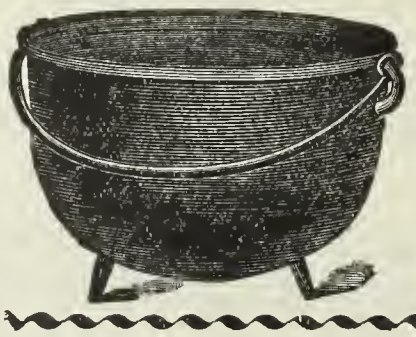

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A Treatise on Pattern Cutting as Applied to all Branches of Sheet Metal Work.

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Printed from new type with a new and improved arrangement, especially convenient for reference and study.

Parts of the former treatise, entitled The Metal Worker Pattern Book, have been utilized in the preparation of this

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but these have been REWRITTEN AND SIMPLIFIED, and later methods embodied which have come into use since the publication of the original work.

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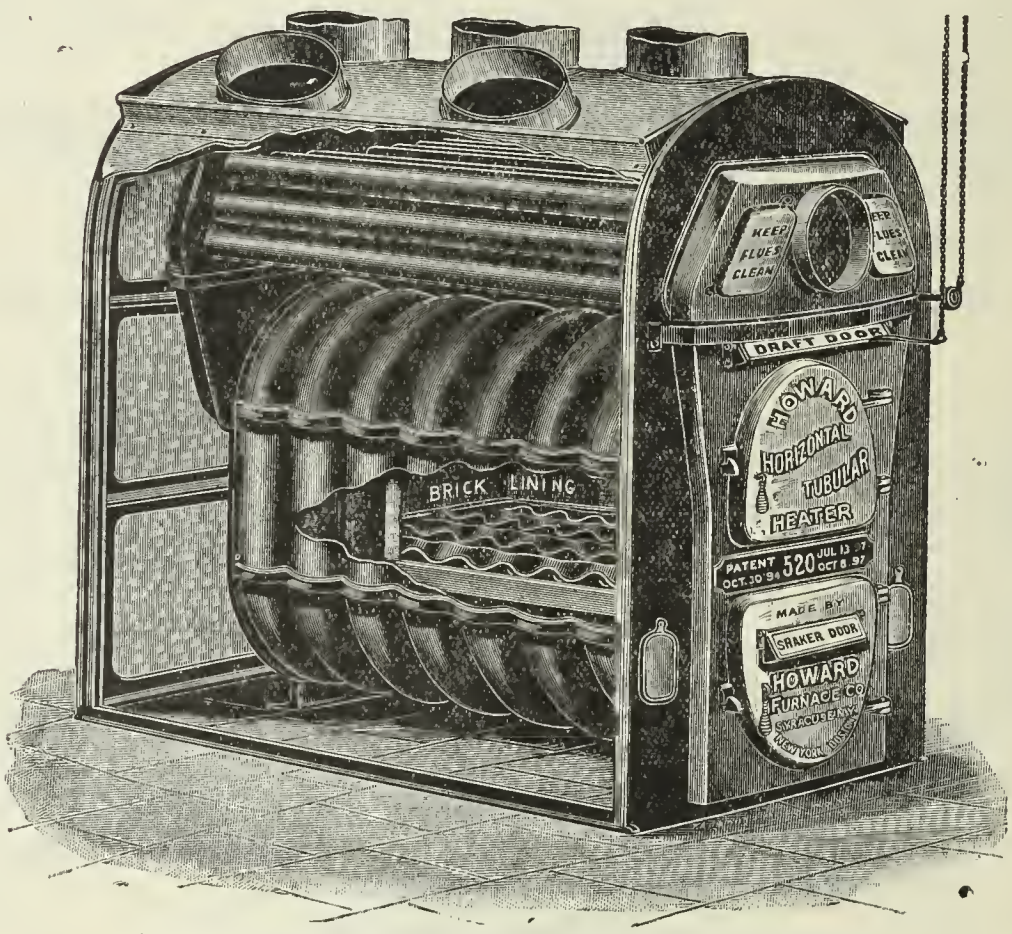

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entices new business

This new furnace means new business. It is made to burn anything that will burn—such as hard coal, soft coal, and wood

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THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, November 13, 1897.

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Volume XLVIII.....No. 20.
Index to Reading Matter.....Page 61.

The Business Situation.

The advent of cold weather in the South has broken the back of the yellow fever scourge. Quarantine restrictions have been removed, bringing about resumption of traffic and a welcome rush of orders for merchandise from that section. At the same time the more seasonable weather which has followed the rains in the Western and Central Western States has favored the farmers and stimulated the demand for winter goods in that region. For which reasons business throughout a large part of the country is still notably brisk. Otherwise the movement of trade in staple lines has been of the quiet character which usually marks the early winter months. In the Eastern States business is found to be somewhat irregular and of moderate volume all told. Nor is any marked improvement in this respect looked for during the balance of the year. Stocks of manufactured goods in dealers' and consumers' hands are believed to be fairly full, and there is no likelihood of any special pressure of orders in the immediate future. Still a fairly liberal movement of goods is expected to continue during the next few weeks, while the indications point to a marked increase in its volume after the opening of the new year. Meanwhile mills and factories are generally busy on orders and in making up stock to meet the large demand anticipated for 1898. Prices in most lines of trade show no material change, but are holding their ground well. The metal trade seems to be an exception, however, for a tendency toward weakness has been developed in copper, lead and spelter, while tin has lost ground during the week. In the iron and steel trade, a falling off in the volume of orders for manufactured goods is noted, but prices are well maintained and the mills have as much work as they can do in filling the contracts booked during the past two or three months. All the accepted indices of trade, such as bank clearings, railway earnings, records of failures, exports, &c., continue encouraging. Last week's total of bank clearings reached nearly $1,250,000,000, or 6 per cent. above those of the previous week, notwithstanding the occurrence of the election day holiday. As compared with the corresponding week of last year they showed a gain of 17.9 per cent. and of 3 per cent. over 1892. Current railway earnings exhibit a very satisfactory increase of about 11 per cent. above last year. Commercial failures in October were smaller in number and liabilities than in any month for four years, except in July and August of this year and in one month of 1894. Wheat fell nearly 4 cents a bushel during the week, although the exports of the cereal are still unusually heavy, while *Bradstreet's* states the available stocks to be lower than at any previous date since 1890. Corn exports, although still small, in comparison with wheat shipments, showed a marked increase last week over the preceding week and over the corresponding period of former years. The price of corn has advanced slightly, but cotton remains at the low price recently touched. The shipments of the staple are increasing, and all indications point to an enormous crop. Money has developed further ease, a superabundance of loanable funds being held by the banks and the demand from borrowers being comparatively light.

Chicago Strike History.

A very interesting table of strikes in Chicago and their results, covering the last 16 years, was recently contributed by a labor leader to a Chicago daily paper. The list enumerates 76 strikes of all kinds, including railroad employees, and in each case the duration and the number of men involved is given. The success or failure of the movement is also recorded. Of the entire number 28 were unequivocally successful, 21 only partially so, and 27 were totally unsuccessful. The successful strikes were principally, and in fact almost entirely, in the building trades. Only nine strikes are credited to the iron and steel and allied industries during this entire time, and of these only one succeeded, while another was partly decided in favor of the employees. The successful strike was among the ornamental iron workers, during the preparations for the World's Fair in 1893, who demanded increased wages and shorter hours. The partly successful strike was in 1886, when molders in brass and iron foundries went out to secure a reduction of hours. In all other strikes in these special trades the workmen were defeated. The results in other manufacturing industries were relatively of the same character.

Strikes in the Building Trades.

The most important inference to be drawn from this table appears to be that workmen in the building trades in large cities are quite uniformly able to maintain their point in a test of endurance with employers over a question of wages schedules or hours of employment. On the other hand, the inference seems to be equally plain that in manufacturing industries the employers are generally able to sustain their contention when a clash of opinions occurs. On looking into the conditions governing these respective vocations, the reason is not hard to find. House building is radically different from manufacturing, because the product is not portable, and competition from an external source as affecting cost or market price or power to sell is wholly absent. Employers and workmen in the building trades of a city can fix a schedule of wages and hours without regard to the practice in any other place on earth, and their business will not be endangered unless they run the cost of building to

such exorbitant figures that owners are deterred from making improvements. Hence, a decided show of strength and cohesive power among workmen in such lines nearly always wins when pitted against builders or contractors, who know that if they lose the point in dispute the owner or capitalist pays the increased cost. But in manufacturing the situation is altogether different. Other factories at other points are competing in marketing the same sort of product, prices are fixed usually by a variety of circumstances operating in the commercial world, and wages and hours are regulated by influences which an individual manufacturer must recognize or be eliminated from the struggle for business. Therefore the success of labor movements in the building trades cannot be properly cited as an incentive for more radical efforts among labor leaders in manufacturing lines.

A Manual Training School at Pullman.

The will of George M. Pullman includes the following provision: "It is my purpose to found, erect and endow at Pullman, Ill., in my lifetime a free school of manual training for the benefit of the children of persons living or employed at Pullman, and in the accomplishment of that purpose to expend at least $200,000 for lands and buildings and apparatus and to provide a fund of $1,000,000 for the maintenance, management and endowment of such school. If, at the time of my death, I shall have founded such school, but shall not have fully made such expenditure or provided fully such fund, I direct that my executors, out of the remainder of my estate, after satisfying all the provisions hereinbefore made, shall set aside stocks, bonds and notes or other securities of the value estimated by them to be sufficient to make, with the moneys already expended by me for such lands, buildings and apparatus, the sum of $200,000, and the properties so set aside I give and bequeath for said objects to the corporation or trustees representing said school, and I further direct that my executors, out of said remainder of my estate, shall set aside bonds, stocks and notes or other securities of the value estimated by them to be sufficient, with the fund already provided by me for the maintenance, management and endowment of such school, to make the sum of $1,000,000, and the properties so set aside I give and bequeath for said objects to said corporation or trustees. If, at the time of my death, I shall not have founded such school, I hereby give and bequeath, out of said remainder of my estate, the sum of $1,200,000 for the founding, erection, maintenance, management and endowment of the Pullman Free School of Manual Training, at Pullman, Ill. and I direct that my executors shall, so soon as practicable, cause a corporation to be formed, either through act of the Legislature of the State of Illinois or under the laws of said State, for the purpose of receiving said bequest and accomplishing the objects thereof. And I request that my executors, Norman B. Ream and Robert T. Lincoln, and my friends John M. Clark, John S. Runnells, Frank O. Lowden, Charles E. Perkins and John J. Mitchell, act as the first Board of Directors or Trustees of said corporation."

William Connor's New Works.

The Olympic Mill property, 669, 671, 673 and 675 River street, Troy, N. Y., has been bought by William Connors for $40,000. This is one of the best manufacturing sites in Troy and has been owned by Orrs & Co. since 1835. It has two large water wheels of 150 horse-power each. Mr. Connors proposes to remodel the present building and equip it especially for the manufacture of American Seal paint, and erect a separate building, which will be used exclusively for the grinding of dry colors. The machinery to be used in operating this plant will be entirely new, of which Mr. Connors is the sole owner and patentee. This extensive improvement is actuated by the steadily increasing demand for American Seal paints, and when completed will be one of the finest plants of its kind in this country. It will be five stories high, with a frontage on River street of 123 feet, running back to the river about 100 feet. Plans are now under way and work will be begun at once and must be completed before March 1.

United States Consul Duester, at Crefeld, Germany, reports to the State Department the discovery there of a new illuminating gas. According to Mr. Duester's account a single jet of this gas of ordinary size gives a light of more than 1000 candle power, and fine print can he read at a distance of 100 feet. The inventor says that the cost for a light of 1500 candle power is only 4½ cents per hour, while that for an ordinary electric light of 400 candle power is 14 cents per hour.

Nashville Awards.

Dr. Gardner Hubbard, Commissioner of Awards, and Dr. David T. Day, secretary of the Jury of Awards, of the Tennessee Centennial Exposition, have reported the awards made in all classes of exhibits. Those of special interest to the readers of *The Metal Worker* are as follows:

Diploma of Honor with Gold Medal.

Schill Bros., Crestline, Ohio.—Warm air furnace.

Diploma of Excellence with Silver Medal.

Wagner Mfg. Company, Sidney, Ohio.—Aluminum. A creditable exhibit of tea kettles, saucepans and other utensils.

Seates Furnace Company, Knoxville, Tenn.—Warm air steel furnace.

Kernan Furnace Company, Utica, N. Y.—Hot air furnace.

Instantaneous Water Heating Company, Chicago, Ill.—Water heaters.

H. Witter Mfg. Company, Memphis, Tenn.—Cooking stove and kitchen ranges.

Buck's Stove & Range Company, St. Louis, Mo.—Buck's steel ranges.

The Michigan Stove Company, Detroit, Mich.—Stoves and ranges.

Phillips & Buttorff Mfg. Company, Nashville, Tenn.—Heating and cooking stoves.

The Cortland-Howe Ventilating Stove Company, Cortland, N. Y.—Stoves.

Nashville Gas Light Company, Nashville, Tenn.—Combination stoves for gas, coal or coke; gas range with hot water attachment.

Bucket Pump Company, Cincinnati, Ohio.—Corrugated triple bottom coal hod, made out of one piece of pressed steel.

Webb, Stevenson & Phillips, Nashville, Tenn.—Stoves, heating and cooking; wood mantels, refrigerators, china, lamps, &c.

Trans Abr Santesson, Stockholm, Sweden.—Hollow ware of tin plate.

To Incinerate Chicago's Garbage.

Andrew J. Murphy has contracted with the city of Chicago to dispose of garbage and ashes for five years at a total cost of $1,251,351. It is his intention to use the Wright system of incinerating the garbage, which is not familiar to Americans but is in use in a number of English and Continental cities, notably London, Liverpool, Birmingham, Leeds and Hamburg. Six incinerating plants are to be built at as many different points in Chicago.

The furnace, which is the essential point of the plant, is built in cells, each cell having a capacity sufficient to accommodate 1 ton of garbage. The cells are lined with fire brick and have a hearth sloped from the center outward, forming a central ridge on which the garbage strikes when dumped into the furnace. The products of combustion pass through separate flues from each cell into the main flue or tunnel, which is in the central part of the furnace, and where the gases are burned before entering the chimney. This fire flue is underneath the bed of the furnaces and serves to keep them heated. The heat for burning the garbage, however, is secured from the flame of crude oil injected from the side of the cell. The amount of garbage that is to be collected daily in Chicago is estimated at 600 tons, so that each of the six furnaces is to have a capacity of 100 tons. Each furnace contains ten garbage cells, holding 1 ton each, and it is estimated in an hour's time this amount will be consumed, so that the furnaces will have to be worked ten hours a day to destroy the entire garbage of the city. The ashes resulting from the garbage, it is expected, will prove a valuable fertilizer, and will be packed in bags and sold. Householders will have to separate the garbage from the ashes and provide a galvanized iron receptacle for the former, the garbage being collected in water tight iron wagons.

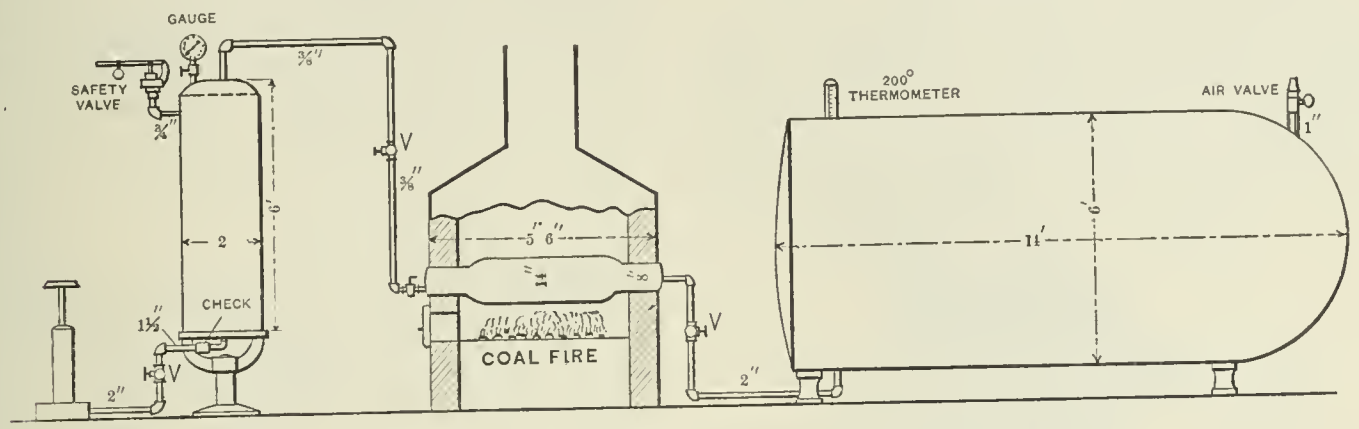
Frederick Haberman of the Haberman Mfg. Company was elected Alderman on the Democratic ticket in the Twenty-ninth district, New York City.

The Glidden Varnish Company, Cincinnati, Ohio, have just completed an addition to their plant, a new brick building 75 feet in length, to give them facilities for the large increase in the demand for their products. They have also added much new machinery to their equipment, and as a result a larger trade is being done.

THE LETTER BOX.

Heating Compressed Air for Vulcanizer.

From H. L. T., Flemington, N. J.—Will you please advise me through the columns of *The Metal Worker* if I can heat compressed air by the plan I send with this letter, Fig. 1. I want to heat molds in a vulcanizer 14 feet long and 6 feet in diameter to 200 or 212 degrees under 30 to 35 pounds pressure. Can it be done? If not by this plan, what suggestion would you offer to heat the air? It is positively necessary to have a dry heat.



Heating Compressed Air for Vulcanizer.—Fig. 1.—Sketch Sent by Correspondent.

Answer.—The heating of a vulcanizing cylinder to a temperature of 212 degrees F. can be readily done by hot compressed air, as our correspondent asks, but the sketch that accompanies his inquiry, which we have reproduced in Fig. 1, does not seem to us to be adequate in detail to accomplish the desired work in the large vulcanizing cylinder shown. We therefore have designed the detailed arrangement, as shown in Fig. 2, with the figured conditions of compression, cooling to condense moisture, reheating for ultimate dryness and temperature, and expansion of the hot air to the required condition of the vulcanizer. The quantity of air required we cannot estimate without knowing the nature of the work to be done. The molds and the shell of the vulcanizer will absorb a large amount of heat at the commencement of each operation, and, as the specific heat of air is very low at the atmospheric pressure (less than one-quarter as much as water per pound, as it requires 13 cubic feet of air to weigh 1 pound) it will readily be seen that a considerable quantity of free air must be passed through the apparatus. Probably 54 cubic feet of free air, or about 14 cubic feet of compressed air at 40 pounds pressure, will be required to do the work in heating equal to the use of 1 pound of water. The drying properties, due to the expansion of hot compressed air, as shown in our illustration, which has been cooled from the compressor and then reheated, is very great. In the modification of our correspondent's plan, we recommend a larger pipe for conveying the air from the compressor to the heater, a cooler of coiled pipe arranged to let the condensed moisture drip into a receiver and a coil of pipe in the heating furnace as being cheaper and more effective than the cylinder shown in the sketch. The hot air should enter the vulcanizer at the top and be allowed to escape at the bottom with the pressure and temperature controlled entirely by the inlet and discharge valves. By this method of governing, the cold air, or air made cooler by contact with the goods and shell of the heater, will sink by gravity to the bottom of the vulcanizer and toward the discharge outlets at each end. Otherwise uniformity of temperature cannot be obtained. By this process very dry air will be obtained and in quantities to meet the requirements. It will also be found that a compressor of more formidable dimensions than the hand appparatus shown in the sketch of our correspondent will be needed for the work required in a vulcanizing cylinder so large as 6 x 14 feet. We suggest a power compressor with a 6 x 7 inch air cylinder.

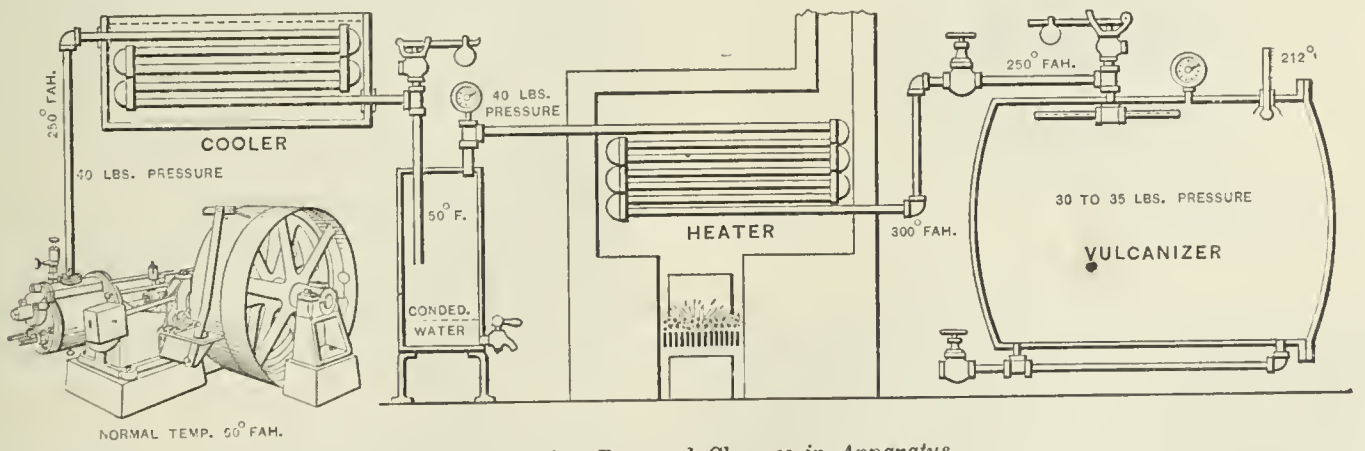


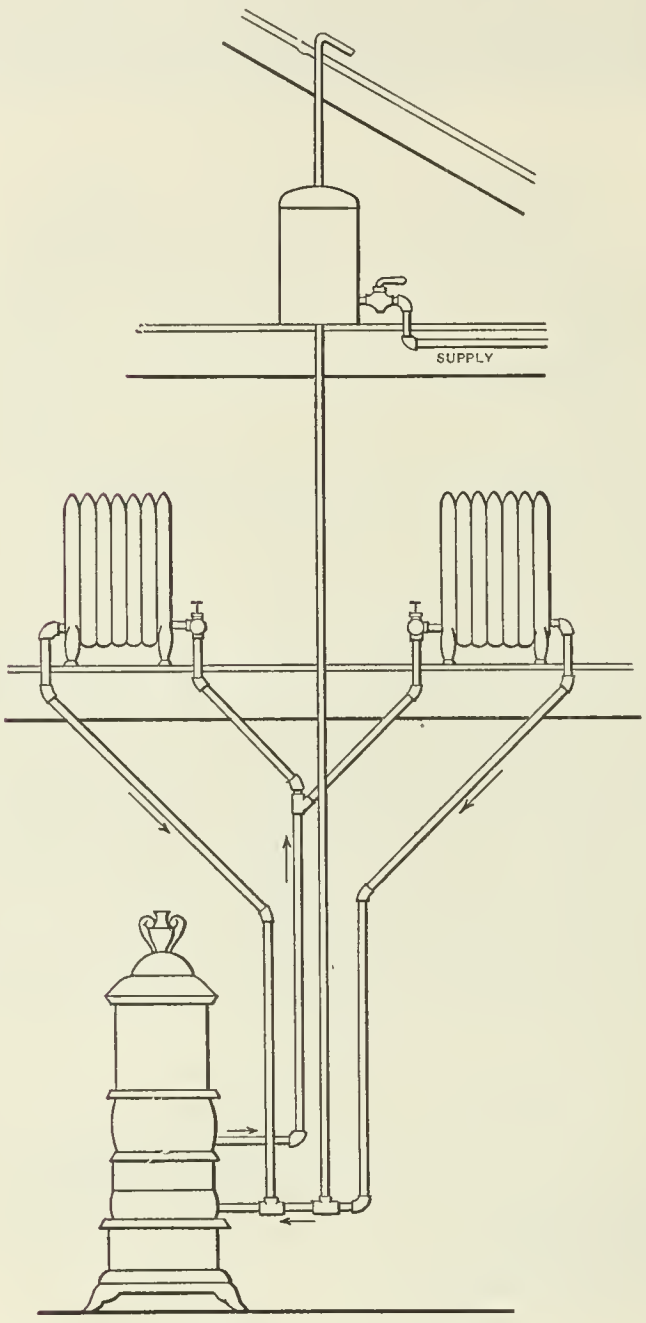
Fig. 2.—Showing Proposed Changes in Apparatus.

Heating From Stove Coil.

From M. & G., Hartington, Neb.—We submit herewith a sketch and description of a hot water heating apparatus which we wish to install. The fire pot in the stove which we intend to use is 17 inches in diameter and we had calculated to use 29½ lineal feet of ¾-inch pipe

to heat 100 square feet of direct radiation located on the floor above the stove, as shown The question which arises in our mind is, Does the coil have a waterway large enough to fulfill the requirements? We think the ¾-inch coil is too small and that a 1½-inch or 2-inch coil should be used.

Answer.—The ¾-inch coil would heat the water, but it has been found in practice that the circulation is restricted and the water overheated so that steam is liable to be generated when a large coil of such small caliber is used. We notice that the coil in question exposes about 9 square feet, or about 1 square foot of surface for every 10 feet of radiation to be heated, and ordinarily 1 square foot of heating surface in a coil, even in a stove, is looked

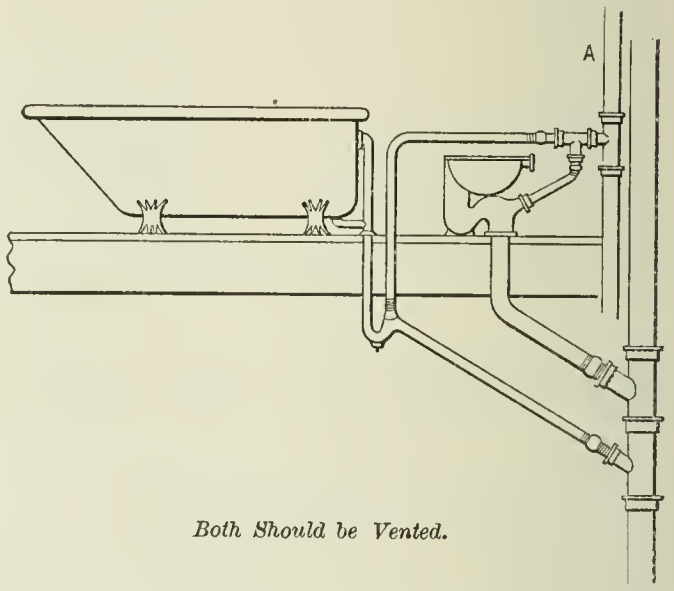


Heating from Stove Coil.

upon as capable of heating more radiating surface than that. Figuring on the basis of 20 square feet of radiating surface to every foot of surface in the coil, 5 square feet of surface would be all that would be required. To determine the size of the pipe that should be used in the coil the size of the radiator connections must be considered. These should be 1 inch for each radiator, and it is generally conceded that a 1¼-inch pipe will supply two 1-inch pipes, and we would suggest that this size would be sufficient for the mains to and from the coil and also that it would be advisable to use this size of pipe in the coil. This, however, is not absolutely necessary, and in this case 1-inch pipe might be used if it can be bent more readily. If our correspondent desires to reduce the amount of piping, the return mains might be connected the same as he has connected the flow mains, and the pipe to the expansion tank might be connected with the return from one or the other of the radiators. If the expansion tank is to be located in a place where there is any possible danger of freezing it would be better to connect a ½-inch pipe with a flow main and run it into the expansion tank at a point below the water line, so as to keep up circulation in it and prevent freezing. If possible the vent or overflow pipe should discharge at a point where it is not likely to freeze. The vapor that may arise from the hot water is liable to collect in the form of frost and finally stop the outlet, and under some conditions would be sufficient to put the whole system under a high pressure and cause its wreckage.

Both Should Be Vented.

From Oliver Twist.—The sketch shown in *The Metal Worker* of September 18 accompanying the letter of "J. R. L," Charleston, is a sample of many such connections. To vent or not to vent is not at the present time a very vexed question. Whatever changes time may make, at the present it is considered by those competent to judge that all traps should be vented. The objection is raised by the house owner usually that to vent all traps is an unnecessary proceeding, making more complicated an already extensive arrangement of piping and whose only good is to swell the plumber's account. People who argue on this line are usually under the impression that it wouldn't matter much if the trap also were omitted or else one was made to answer for several fixtures. If a plumbing job is well planned, neither the waste nor vent pipes will be any longer than are necessary, but however short they may be, the more fresh air that can be got to circulate through and around them the more sanitary they will be and the longer they will last, for to confine sewer gas in a pipe is to assist its corrosion.



Both Should be Vented.

Some regulations require traps to be vented from the crown or the highest point of trap, while others claim there is less liability of the entrance to the vent pipe becoming choked if the junction is made a little further around the bend, as shown in the closet trap in the sketch herewith. It is better practice to connect the bath waste to the soil pipe with a separate branch than to join with the bend beneath the closet, as it will surely be choked by the accumulation of filth passing over it continually if arranged as shown by "J. R. L.," and the bath trap could not resist siphonage for any length of time.

The vent stack A is preferably continued through the roof independently and should be connected to the soil pipe stack with an eighth bend below the lowest fixture, the idea being to remove all condensation.

The fire loss of the United States and Canada for the month of October, as compiled by the *Journal of Commerce*, amounted to $11,387,500, the largest monthly figures in the current year, with the exception of the month of January. The aggregate fire losses for the first ten months of 1897 is, however, still more than $7,000,000 below the losses for the same period of last year and $18,000,000 less than in 1895.

HEATING AND PLUMBING.

Unsatisfactory Prices.

With iron pipe and fittings at a higher price it would seem natural that other heating goods should keep them company. That they do uot is not strange, however, when on investigation it is found that the amount of pipe and fittings used for heating is only a drop in the bucket, as it has been expressed, compared with the amount used in other fields. The downward treud in prices on other heating goods which is being struggled against is the after result of many architects having been poorly employed during the year.

A member of the radiator trade has remarked that prices are unsatisfactory. While the small buyer or the purchaser of a few hundred feet of radiation may not note any waver in the market, it is freely asserted that buyers of large quantities have only to wait to have the goods offered below what is considered the ruling price. A manufacturer of house heating boilers described the situation by saying they held their prices satisfactorily till the opening of the year and then they started in to stiffen up, but in the summer things changed, and changed so much that they simply had to lower prices iu order to get their share of the trade.

Many houses that from the boilerman's standpoint should be heated by steam or hot water have been arranged for furnace heating, as there seems to be strong objection on the part of the buying public to purchase anything that is not low in cost.

Letter from President Culloton.

We have the following letter from President Thos. P. Culloton of the National Association of Master Plumbers, dated Chicago, November 3:

I regret to note in your issue of October 30 an article entitled "Dissatisfaction Amoug Westeru Plumbers," and stating that "Dissatisfaction has arisen over some questions in which it is claiued that the Eastern members have exercised undue influence in the national body. The largest membership in the National Association being in the East, the charge is made that the interests of the West are not so well cared for as they would be with a purely Western association composed of membership residing in the Western States."

This is news to me, as it is to many others in this section and further West, and I think a most erroneous report, for such feelings or conditions I do not believe exist in any quarter of the country, not alone the West. The master plumbers are loyal to the National and there is no desire to form a Western association, composed of members residing in the Western States, apart from the National; and no feelings of any kind but of a harmonious nature exist between the master plumbers in all parts of the Western States as members of the National Association.

Lead Poisoning from Domestic Water Supply.

The following, published in the "Excerpt Minutes" of the British Institution of Civil Engineers, is translated from the *Gesundheits Ingenieur:*

An account is given of a case of lead poisoning which occurred in a forester's lodge situated in a bathing resort in the mountains. The supply of water was formerly taken from a spring, distaut about 50 m. or 60 m. from the house, bnt for the sake of convenience a pump was fitted up in the house and a lead suction pipe was connected with the spring. It came out in the evideuce that the plumber, in laying the pipe, allowed a lot of the lead filings to remain in the joints, soldered in the usual way. A very few days after the completion of the work the daughter of the forester fell ill, and subsequently the mother and the father suffered acutely from colic. Finally the girl died; lead poisoning was diagnosed, and a Government inquiry was instituted into the water supply. The post-mortem had demonstrated the preseuce of lead in several of the organs, and the water, which was extremely pure, was found to contain 0.95 mg. of dissolved lead per liter (about 1½ grains per quart). The degree of hardness was only 1.4. The anthor directs attention to the facts of this case as elicited in the course of the inquiry, and to the manifest danger of the nse of lead service pipes in the case of a water supply of great purity and freedom from hardness.

A New Water Closet Floor Connection.

This invention, exhibited by the Dimock & Fink Company, 220 East 125th street, New York, and 285 Warren street, Jersey City, N. J., at the American Institute Fair, lately held in Madison Square Garden, attracted a great deal of atteution from plumbers, architects and builders on account of its practicability and the advantages it possesses as a sanitary method of connecting a water closet with a house drainage system. The connection is the in-

A New Water Closet Floor Connection

vention of C. H. Moore and consists of a brass screw fitting, so made that it sets into a corrugated and notched recess in the base or foot of an earthenware closet, and is calked with lead and cemented in a tight and immovable manuer, as shown in the cut. A corresponding threaded brass coupling, marked 4, is then soldered to the end of the lead soil pipe or bend, marked 7, that extends through the floor. The closet is screwed into this coupling, giving a permanent and rigid joint which cannot be broken by the jarriug of the closet or the settling of the building. A little paste of oil and plumbago smeared on the threads is used to facilitate screwing up the joint. The brass coupling 4 is marked "Front," so that the plumber when soldering it to the lead bend, marked 7, puts the part so marked to the frout, thus insuring the right position of the closet when screwed down until the base touches the floor slab.

A few of the advantages which are claimed for a closet fitted with this connection are as follows:

The closet cannot be put in place without being screwed down, and therefore nothing but a tight and durable joint can possibly be effected

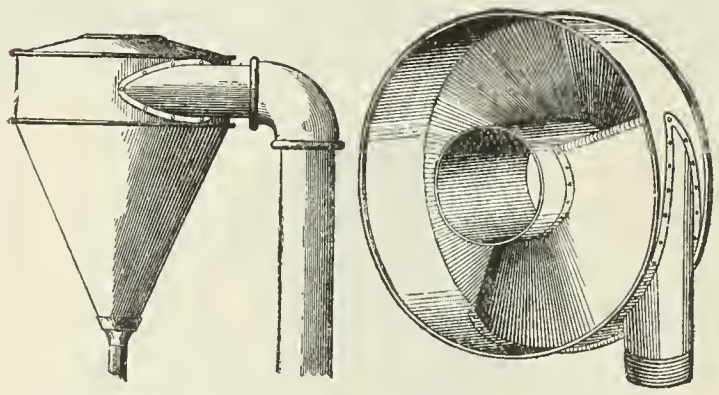
It the closet has to be removed it is only necessary to unscrew it.

Any settling of the building cannot affect the joint.
No liability of breaking the earthen flange.
No liability of discoloring a marble floor with oily substances.

Circulars giving full description and instructions for setting will be sent on application to the manufacturers.

The Common Sense Exhaust Head.

The exhaust head manufactured by Bingham & Co., 221 Cherry street, Philadelphia, contains but one chamber, into which the steam enters at the top. The steam inlet is connected horizontally with the head, and the force of the steam coming into the chamber at the tangent gives it a lateral rotary motion which sweeps it around and around the wall of the chamber. This rotary motion brings the particles of water, grease and oil with which the steam is charged into contact with a very large condensing area, upon which they collect, then run, by gravity, to the drip below. A spiral deflecting plate is so placed as to offer no obstruction. Its only object is to direct the steam downward, so that in the second and succeeding revolutions there can be no conflict or confusion with the incoming steam, and consequently no noise. The discharge pipe does a double duty, being also the trap. It is very deep, the depth being in all size heads three times the diameter of the steam inlet. It will thus be seen that the steam must make quite a number of



The Common Sense Exhaust Head.

revolutions before it reaches the opening of the discharge. By this time it has been divested of all water, oil and grease, so that nothing but dry steam escapes to the outer air. The sectional area of the discharge pipe is three times that of the inlet, free discharge being thus assured.

NOTES.

Hickey & Farrell have opened a plumbing shop in the Gamwell Block, on Columbus avenue, Pittsfield, Mass.

The C. A. Bray Company have been incorporated, with C. A. Bray as president and treasurer, with a capital stock of $5000, at Boston, to carry on a sheet iron work and plumbing business.

At the last meeting of the Board of Health of Williamsport, Pa., a committee of master plumbers entered a complaint that the regulations of the city were not being enforced, and that those plumbers who had paid their license fees and conformed with the law were forced to compete with plumbers who had saved themselves the expense of taking out a license and paid no attention to the city regulations.

We have received from D. A. Streeter, Waterbury, Conn., a circular of his Pipe Plug. The Plug is designed for use in cast iron service and drainage pipes, and is so made that it can be readily removed when the piping system is to be extended, or may be used for testing, being so constructed that it can be calked in the regular way and yet be easily taken out.

The Stradling Heating & Plumbing Company of Utica, N. Y., have secured the contract for heating and ventilating the Masonic Temple now being erected in Utica, The contract calls for two No. 92 Royal Steam Heaters. made by the Hart & Crouse Company, of Utica; Electric Exhaust Fans and Direct and Indirect Radiation. G. Edward Cooper, Utica, N. Y., is the architect of the building, and the heating and ventilating system was designed by W. M. Mackay of New York City. The system will cost about $4000.

James H. Lyons, a prominent business man of Philadelphia, died at his residence, 1608 Wallace street, in that city, on November 5, aged 58 years. He began his business career as a plumber and afterward became an operative builder, putting up over 1000 houses in the northwest section of Philadelphia. Six years ago he built the Keystone Pottery, at Trenton, N. J., and operated it with two partners. On April 1 last he withdrew from the concern and organized the Lyons Pottery Company, for the manufacture of sanitary ware, at Camden, N. J., in which business he was actively engaged at the time of his death. He leaves a widow, two sons and one daughter.

The Norwich Nickel & Brass Company have been incorporated at Norwich, Conn., with a capital of $15,000, of which $3000 is paid in. The incorporators are William A. Aiken, Eliza C. Aiken, William B. Aiken, Alfred L. Aiken and Edwin A. Tracy.

Charles A. Kinney, the New England representative of Clark & Howard, at Mexico, N. Y., has sold a Safety Engine and Boiler to William B. Cashen and James T. Kay, plumbers, of Meriden, Conn., to run three pipe machines. The boiler is so constructed that it may be used for either steam or hot water heating.

Thomas McBride of the plumbing firm of E. & T. McBride, Portland, Maine, died recently at his residence at the age of 39 years.

W. T. Holton, Boothbay, Maine, is putting a Gurney Hot Water Heating System in the Post Office Building and the dwelling of W. Morrison.

W C. Joy, 152 Centre street, New York, manager of the Titusville Iron Company, Titusville, Pa., informs us that the company made during the month of October one-third more Radiators than they had ever made in any one month heretofore. They have recently shipped three carloads of Radiators to such widely separated points as Portland, Ore.; San Francisco, Cal., and London, England. Their Zenith Radiators were used in refitting Marlborough House, the London residence of the Prince of Wales.

C. F. Gessert, 42 Dey street, New York, is handling promptly the orders for Radiators which the heating contractor places with him, and he exhibits a fine line to select from.

The Gorton & Lidgerwood Company, 96 Liberty street, are exploiting their Gorton Wrought Iron Side Feed Boilers for hard or soft coal on a new line. They have a fine collection of "long service" testimonial letters from those who have used the Gorton boiler for a dozen or more years with no expense for repairs.

The H. B. Smith Company, 133 Centre street, New York, have now on their sample floor one of the new large size No. 3 Mercer Boilers, fitted for steam, among other attractions to the heating contractor.

The Calcium Carbide used in the generation of acetylene gas is manufactured by the Acetylene Light, Heat & Power Company, Niagara Falls, N. Y.

Charles J. Gillis of the firm of Gillis & Geoghegan, heating contractors, 537 West Broadway, New York, who spent the summer abroad, discourses entertainingly on the methods of heating on the Continent. The heating of the best hotels in St. Petersburg, he says, is very primitive compared with the heating of such buildings here.

The Armstrong Mfg. Company, Bridgeport, Conn., and 139 Centre street, New York, report that their new No. 0 Pipe Machine has proven so popular as to have kept their plant running overtime to meet orders. They are making the threading tools that are used for threading the light interior-insulated tubing used for electric conduits.

An unusually large number of Wind Mills have been shipped recently from this country to Australia in response to orders, and it is believed by export houses that a good market for these goods is likely to be found there. There have been also some large shipments of Bathtubs to Australia lately.

The investigations which have been made in New York State as to the liability of natural gas being found have been rewarded with considerable success, and as a result companies are being formed and collections are being made to bear the expense of sinking gas wells in a territory covering a large section of the State. At Rome, N. Y., the gas wells have been utilized by the manufacturing companies for running their various plants. Men who have had experience in drilling for gas in Pennsylvania and Indiana are finding occupation in New York State. In many of the smaller towns, where a good flow of gas has followed the drilling, the effect has been beneficial to local industries. This has been a sufficient incentive to continue the search in other places, and from the accounts coming in it may be assumed that the labor has been attended with success.

The Smith & Anthony Company, proprietors of the Sanitas Mfg. Company, 48-54 Union street, Boston, Mass., are enjoying an excellent demand for their Sanitas Closet Range, a ventilating closet with a series of seats operated automatically from one tank, which has been on the market but a short time. A number of these closets have been placed in Bowdoin College, Brunswick, in a school at Lewiston and various other places in Maine. One hundred and twenty-five are placed in schools in Hartford,

Conn., and the company have orders for 46 more in Providence and Chicopee, Mass. They are also placing them in Amherst and elsewhere in New England, besides having sold them for use in a school at Plainfield, N. J. George W. Knapp, who is with the Smith & Anthony Company, speaks in the most enthusiastic terms of this sanitary device, and as he is thoroughly conversant with all forms of closets and waste disposal apparatus, he is in a position to back up his opinion with persuading arguments.

A recent issue of an English journal describes a new system of hot water heating introduced by Cope, Allman & Co., Birmingham, England. The description is very inadequate, but it appears, however, to be a system in which the water is heated by a steam jet from a neighboring steam boiler and the circulation is effected by the pressure of the steam. The water, it is claimed, can be circulated any required speed from 300 feet upward per minute. Among the advantages claimed are a saving of one-third in fuel and the rapidity with which a large building may be heated. The pipes may be placed over or under doors or any obstacles, and may be twisted in any desired form without interfering with the circulation, and the apparatus will work with as low as 10 pounds pressure of steam.

M. E. Monash of the Monash-Younker Company, Chicago, has been spending a few days at their New York office at 96 Centre street. He reports a growing trade for the Star Couplers among the steam and hot water heating trade. The Couplers are used for making a connection with house water service to supply the boilers. With these Couplers the pipe fitter can readily do the work.

Fred. J. O'Brien has purchased the plumbing business of Charles E. Wills on lower Second avenue, Lansingburg, N. Y.

Plumbers' licenses have been granted to H. E. Blaisdell, W. M. Debet and Thos. Lydon of Berlin, N. H.

The Polaski Block, Alma, Mich., has just been completed and accepted. The plumbing was done by Brown Bros. and the galvanized iron work by J C. Albright of Saginaw, Mich.

In a communication from the International Radiator Mfg. Company, Cheektowaga, N. Y., they announce the resignation of C. E. Safford, who was formerly president of the company. At a meeting of the company, held at the works at Cheektowaga, November 6, 1897, the following officers were elected: S. M. York, Cleveland, Ohio, president; Fred. D. Johnson, New York City, vice-president; John W. Fisher, Buffalo, secretary, and F. D. Gridley, Buffalo, treasurer. The company have now finished and ready for shipment a new Radiator, exposing 5½ feet per loop, with 2½-inch centers, decorated in the Empire style, and are shipping samples to some of their trade. Their general sales agents, Fred. D. Johnson & Co., 80 Centre street, New Yory City, will quote the trade prices on application.

John H. Welteroth, a well-known contractor and plumber of Williamsport, Pa., figured in a hunting adventure last week that will make him envied by many ambitious Nimrods. Accompanied by H. B. Fries he went to Laurel Hill on a hunting expedition and the second day brought an unexpected adventure in the shape of a 200-pound bear, which, according to all accounts, made itself decidedly disagreeable and would shortly have proved responsible for a coroner's inquest had it not been for some well directed shots from Mr. Welteroth's rifle, which stopped its career. Mr. Welteroth, it appears, was unprepared for the attack, and had it not been for the fact that his companion fired a charge of bird shot into the bear and distracted its attention the attack might have proved serious. An illustration in one of the Williamsport papers, which does not purport to have been made from a photograph taken on the spot, presents an exciting situation, but hardly a flattering portrait of the hunters engaged.

The interests of T. W. Fritts & Co. and Tom Fritts Hardware Company, Chattanooga, Tenn., have been consolidated under the latter style, and the business will be continued at the old stores, 819 Broad and 721 Market streets. A wholesale as well as retail trade is done in Shelf and Heavy Hardware, Agricultural Implements, Sporting Goods, Mill Mine, Railroad and Plumbers' Supplies, Harness, &c. The company expect to occupy a new storeroom on Market street by April of next year. The building will comprise four stories and basement, 24 feet wide by 200 feet in length, and will be fitted up in the most approved fashion.

The Metal Worker is indebted to the Paterson, N. J., Master Plumbers' Association and the courtesy of the secretary, John Campbell, for an invitation to be present at the "smoker" of the association, to be held at the close of the State Convention on Wednesday, November 17, in Helvetia Hall, 56 Van Houten street. The invitation gives the names of the officers and members of the association.

S. H. Woodbury & Co. of Brewer, Maine, have been licensed under the Bangor laws as plumbers.

Runyan Brothers, New Castle, Ind., have moved their plumbing shop from the room on East Broad street to the basement of L. A. Jennings' hardware store.

The American Boiler Company, Chicago, have enjoyed some good orders recently, among them being one for a full carload of boilers to go to a Western city. Their business is now, however, showing some signs of the usual tapering off with the approach of winter.

Expanded Metal in Pavement Work.—In San Francisco, Cal., a paving material consisting of steel and concrete in combination is being laid in some of the principal streets which is expected to give the best results. Expanded metal is the form in which the steel is used. The earth of the street is then graded into shape and covered with a bed of sand. On this sand is laid the sheet of expanded steel. Over the steel is then laid a layer of concrete. The concrete is stamped into the meshes of the metal, forming a perfect bond. This makes a foundation that will never give way. Upon it can be laid asphalt, bituminous rock, basalt blocks, wood blocks, brick or any kind of surface pavement desired, the permanency of the entire pavement depending entirely upon the character of the top work.

The Pittsburgh Reduction Company, manufacturers of aluminum from the ore, have appointed C. Sidney Shepard & Co., 23 and 25 Randolph street, Chicago, agents for the sale of their products. These consist of aluminum in ingots for remelting, aluminum alloys, castings, rods, wire, bars, shapes, sheets, plates, seamless tubing, &c. The company have closed up their Chicago branch, in which they formerly carried large stocks. The acquisition of this business gives the house of C. Sidney Shepard & Co. more prestige than ever in the metal trade. They have always been prominent in this line, but the addition of aluminum, as representatives of the producers, greatly increases their importance. They have just issued an aluminum price-list, which they will be pleased to furnish on application.

A Boston engraver, Joseph D. Young by name, has engraved the whole of the Lord's Prayer on the head of an ordinary pin. The lettering starts on the edge of the pin head and circles round in a spiral until it finishes in the center. Seen through a powerful magnifying glass the letters are said to be as distinct as the type of a newspaper, showing surprising delicacy of touch on the part of the author.

The total miles of telegraph wire in the world is estimated to have reached 4,908,921, not counting 180,440 miles of submarine cable. Were this all in one continuous line it would wrap around the equator about 198 times. The moon and earth could be connected by 20 lines, with enough to spare to connect every country on the earth. Of the total amount, Europe has 1,764,790; Asia, 310,685; Africa, 99,419; Australia, 217,479, and America, 2,516,548.

Probably the most novel feature of the Trans-Mississippi and International Exposition, to be opened at Omaha, Neb., on June 1, 1898, will be the "Sherman's Umbrella," a mechanical invention by which passengers will be elevated to a hight of 300 feet and revolved slowly within a circle of 250 feet diameter. The "umbrella" will exceed in hight the celebrated Ferris wheel.

Washington Hardware Company, 928 Pacific avenue, Tacoma, Wash., who are making a specialty of Alaska outfitting, are issuing with their compliments Gascon's map of the gold fields of Alaska, showing the latest discoveries, the new passes, proposed railroad route and supplying other information on the subject. They also send out a circular giving a copy of the laws that govern placer mining on the Yukon River, and full information as to nature and size of claims, the forms of assignment, applications for grants, &c. Besides their regular stock the company are carrying a full line of Prospectors' and Mining Tools and Boat Builders' Supplies.

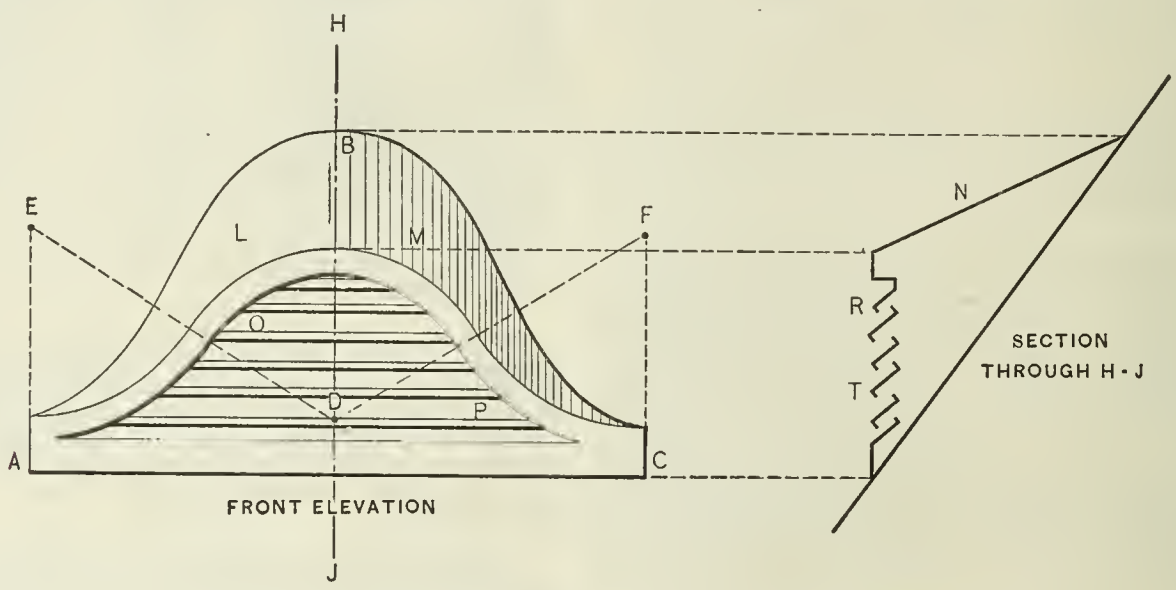
Major Moses P. Handy, commissioner-in-chief for the United States to the Paris Exposition of 1900, has obtained 200,000 square feet of space for American exhibits in the engineering and machinery line. From present indications Major Handy looks for a very large and representative collection of exhibits from this country. He regards the opportunity offered by the forthcoming exposition as the most favorable that has yet been afforded to the manufacturers of America for the extension of their trade in Europe and the countries of the Orient.

SHEET METAL WORK.

PATTERNS FOR AN EYEBROW VENTILATOR.

A correspondent, writing for the patterns for an eyebrow ventilator, says : Please let me know how to cut the patterns of an eyebrow ventilator on a pitched roof, a sketch being shown in Fig. 1. In this view A B C represents the front elevation of the ventilator, the arcs being struck from the center points D, E and F. A section taken on the line H J in elevation is shown at the right, L M shows the roof of the ventilator represented in section by N, while the louvers are shown in elevation by O P and in section by R T.

Let A B C, in Fig. 2, represent one-half the elevation of the ventilator, and E F G a side view, of which E G is the line of the ventilator, E F that of the roof and G F the line of the pitched roof against which the ventilator is required to miter. The front and side views being placed in their proper relative positions, the first step is to obtain



Patterns for an Eyebrow Ventilator.—Fig. 1.—Elevation and Section.

sections on E G and G F. Trace a line through the points of intersections thus obtained ; then will P R S T represent one-half the pattern for the roof. For the pattern for the shape of the opening to be cut in the roof proceed as follows : Transfer the line G F with the various intersections thereon to any vertical line, U V, as shown by the small figures 1^6, 2^6, 3^6 4^6, &c. In similar manner transfer the line C B in front view with the various intersections thereon to the line Z Y, which is drawn at right angles to U V, as shown by the small figures 1, 2, 3, 4, &c. Now at right angles to U V and from the small figures in the same draw lines, which intersect with those of similar numbers drawn at right angles to Y Z. Trace a line through the points thus obtained; then will U X Y Z be one half the pattern for the shape of the opening to be cut into main roof.

For the patterns for the louvers or slats proceed as follows : Let A B C, in Fig. 3, represent a duplicate of a true section at right angles to E F, as follows : Divide the curve A to B into a number of equal spaces, as shown from 1 to 9. At right angles to A C or E G and from the small figures on A B draw lines intersecting E G in side view, as shown Then from these intersections and parallel to E F draw lines, intersecting the roof line G F at 1^5, 2^5, 3^5, 4^5, &c. Parallel to E F and from the point G draw any line indefinitely, as G H. At right angles to E F and from point E draw the line E H intersecting lines previously drawn at 1^1, 2^1, 3^1, 4^1, &c., as shown. Now take a duplicate of the line E H with the various intersections thereon and place it on the center line A C extended as K J.

At right angles to K J and from the small figures 1^2, 2^2, 3^2, &c., draw lines, which intersect with those of similar numbers drawn at right angles to C B, and from the points on the curve A B. Trace a line through the points of intersections thus obtained; then K L M J will be one half the true profile on the line E H in side view, and from which the stretchout will be obtained in the development of the pattern.

For the pattern for the roof of the ventilator proceed as follows : At right angles to E F in side view draw the line N O, upon which place the stretchout of one-half the true profile on line E H, as shown by the small figures 1^4, 2^4, 3^4, 4^4, &c. Then at right angles to N O and through the small figures draw lines, which intersect with those of similar numbers drawn at right angles to E F from inter. the inside opening of the ventilator shown in Fig. 2, and let 1 2 3 4 5 represent the sections of the louvers which will be placed in this opening. As the methods of obtaining the patterns for the louvers are alike, the pattern for louvre No. 4 will illustrate the principles employed. Number the various bends of the louver, as shown by points 6, 7, 8 and 9. At right angles to A C and from these points draw lines intersecting the curve A B at 6^1, 7^1, 4^1, 8^1, 9^1. On A C extended as E D place the stretchout of the louver No. 4, as shown by the small figures on D E. Since the miter line is a curve it will be necessary to introduce intermediate points between 7 and 8 of the profile in order to obtain this curve in the pattern. In the present instance the point marked 4 has been added. Now at right angles to D E and through the small figures draw lines, which intersect with those of similar numbers drawn parallel to A C from intersections 6^1, 7^1, &c., on the curve A B. Trace a line through points thus obtained, and F K J H will be one half the pattern for louver No. 4.

FLASHINGS.

Quite recently J. M. Robinson & Co., Cincinnati, Ohio, have added several improvements to and increased the power and strength of their 10 and 12 foot V-Crimping and Corrugating Machines used for pressing sheet metal in 10 and 12 foot lengths into various forms for architectural iron work. The improved machine will press 2½-inch pitch by ⅝-inch deep corrugations into No. 8 gauge gal-

vanized sheet iron, or No. 16 gauge with 3-inch pitch by 1-inch deep corrugations, in sheets 10 and 12 feet long. The finished sheets, the company state, are true without a curvature, and will lie flat on the floor without pressure, the value of which will be appreciated by all manufacturers of sheet metal roofing, siding and ceiling. The same machine will press three or four sheets at a time of lighter gauges, and will press weather boarding, skylight bars, brick siding and roll capping. Recent demands have been made for heavy gauge material for use in architectural work, and Messrs. Robinson & Co. have in consequence brought out the above named improvements, thus enabling their patrons to comply with all demands for light and heavy gauge sheet iron formations.

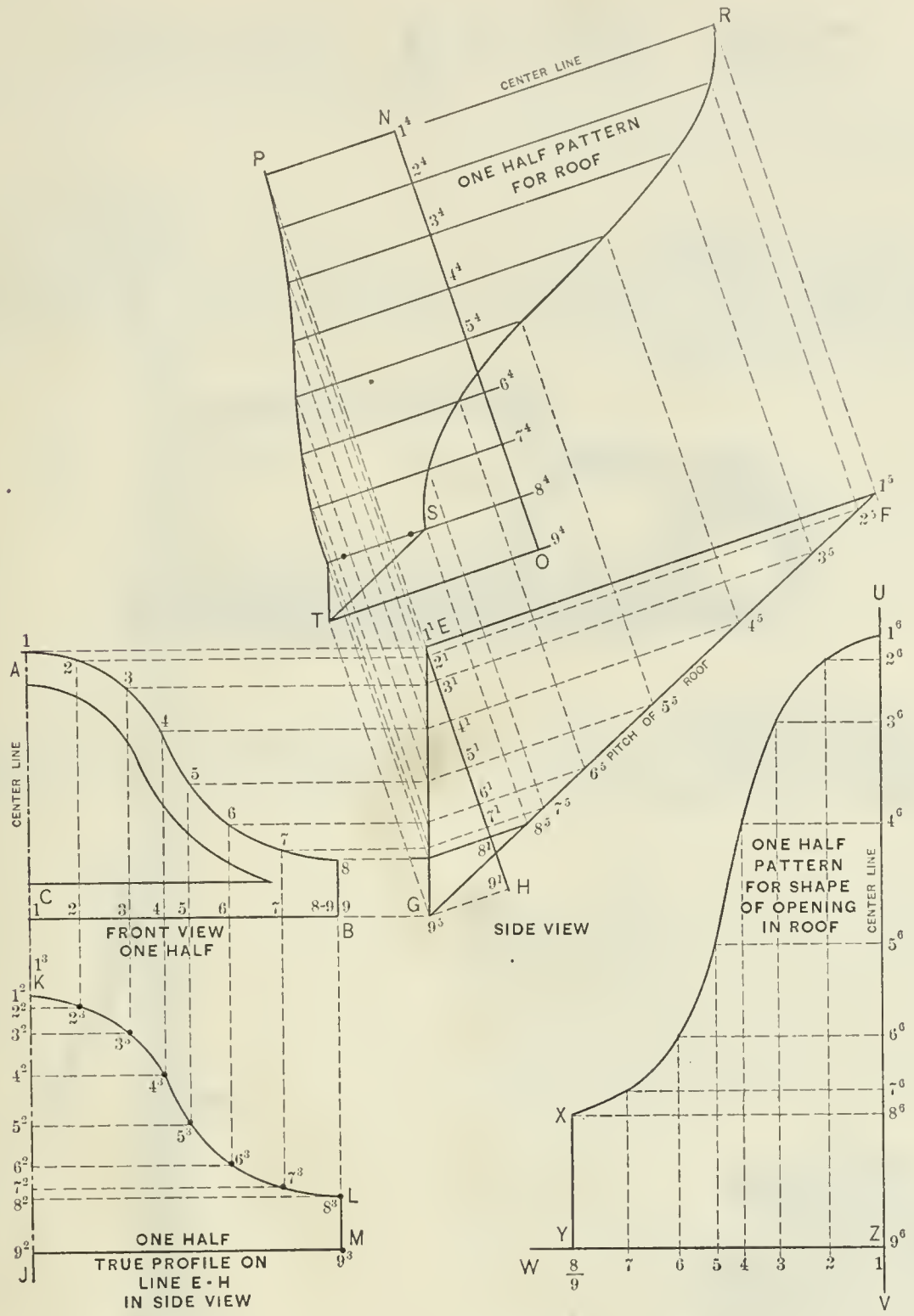

CENTER LINE
ONE HALF PATTERN FOR ROOF
FRONT VIEW ONE HALF
SIDE VIEW
ONE HALF TRUE PROFILE ON LINE E-H IN SIDE VIEW
ONE HALF PATTERN FOR SHAPE OF OPENING IN ROOF
6" PITCH OF 5" ROOF

Fig. 2.—Front and Side Views, Profile and Patterns.

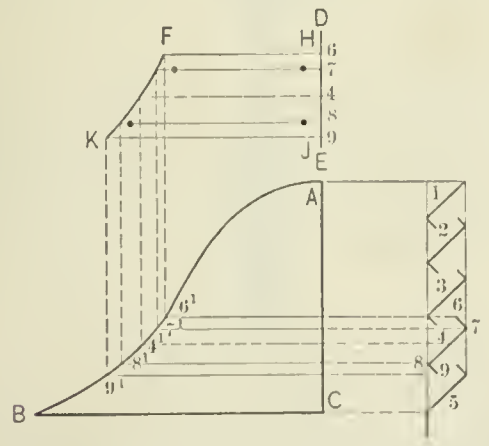


Fig. 3.—Method of Obtaining Patterns for Louvers.

Orders for Galvanized Sheets from South America are still going in large volume to England. The British makers' quotations are said to be about 7½ per cent. below the figures obtained from the United States. A great deal of Galvanized Corrugated Iron is being used for building purposes on the Southern Continent.

John Schwing, Bridgeport, Conn., is getting out the copper cornices, dormer windows and skylights for the Pequonnock Bank Building. He also has the contract for the copper work on the boiler house, cottage and potting house of John T. Williams at Glenbrook, cornice work for C Swartz's building in South Norwalk and skylights for M. Flaherty's new block in Derby and the Jackson photograph gallery in Norwalk.

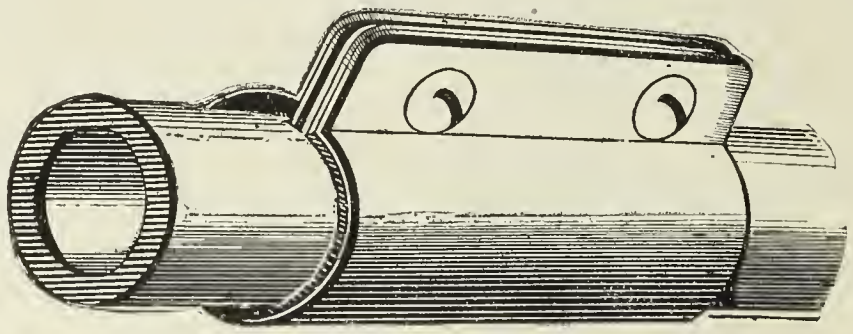
Articles of incorporation of the Art Metal Relief Company have been filed with the County Clerk of Covington, Ky. The incorporators are John G. Meyer, John Weitzel and Richard Kabitzch, the capital stock being $5000.

Judge Grosscup of the Federal Court in Chicago has rendered a decision holding the World's Columbian Exposition Company responsible for the losses to the French Republic and French exhibitors by reason of the fire which took place on January 8, 1894.

THE RETAIL STORE.

Smith's Pipe Patch.

Kenmore Mfg. Company, 75 Chambers street, New York, are marketing Smith's pipe patch, here illustrated. It consists of a plate of zinc, formed as shown in the cut, having a double thickness where the round head stove bolts clamp the parts together. Inside the tube is a piece

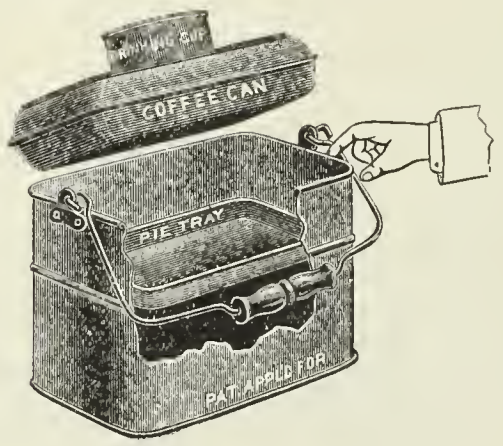


Smith's Pipe Patch.

of rubber packing to insure a tight joint. This device is designed for repairing sudden leaks in lead pipe by any individual without the use of solder, by simply opening the patch wide enough to receive the pipe and then screwing until tight. The goods are supplied in ⅜, ½, ⅝, ¾ and 1 inch sizes.

Granite Steel Dinner Pail.

Herewith appears an illustration of the new Granite steel dinner pail just brought out by Kieckhefer Brothers Company, Milwaukee, Wis. The illustration represents the side of the pail broken away, disclosing the interior arrangement. A prominent feature of this pail, aside from the fact that it is made of the company's Granite steel ware, is the reversible cover. This cover forms the coffee receptacle and has a drinking cup on top. The pail is constructed so as to act as a spring in holding the cover in place when put in the pail. The cover can be reversed, so



Granite Steel Dinner Pail.

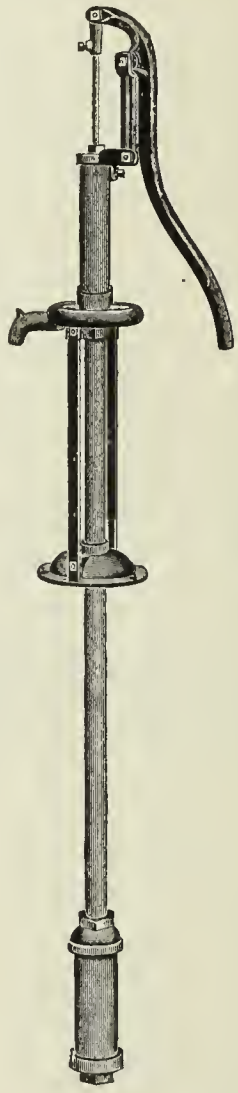
that the drinking cup will be under it and concealed from observation. Three sizes are made, consisting of small, medium and large sized pails.

Matthai, Ingram & Co., Baltimore, Md., are now engaged in the erection of a large addition to their plant. The new structure will be six stories high, 55 feet wide and 300 feet long on Ohio avenue, with an ell extension of 40 feet, making a total length of 340 feet. With this enlargement their factory, which occupies almost two city blocks, will have a floor space of over 11 acres. The new premises are designed to furnish increased shipping facilities and will also be devoted to the manufacture of some new goods which the company are intending to put on the market.

Louis Fontenot, dealing in Stoves and Tinware at Crowley, La., has recently moved his establishment to Parkerson avenue, between Stagg Brothers and the Hincliffe Building, where he will be more centrally located.

The Rainbow Pump.

An illustration is herewith given of a new pump brought out by the Moline Pump Company Moline, Ill. and named the Rainbow. It is a single acting pump, which, it is stated, throws as perfect a continuous stream as any double acting pump. The company claim to have been the first to succeed in accomplishing this feat, which has been often attempted by pump manufacturers. The base is adjustable. The finish is a departure from the old colors and very attractive. It is made with 2½, 2¾



The Rainbow Pump.

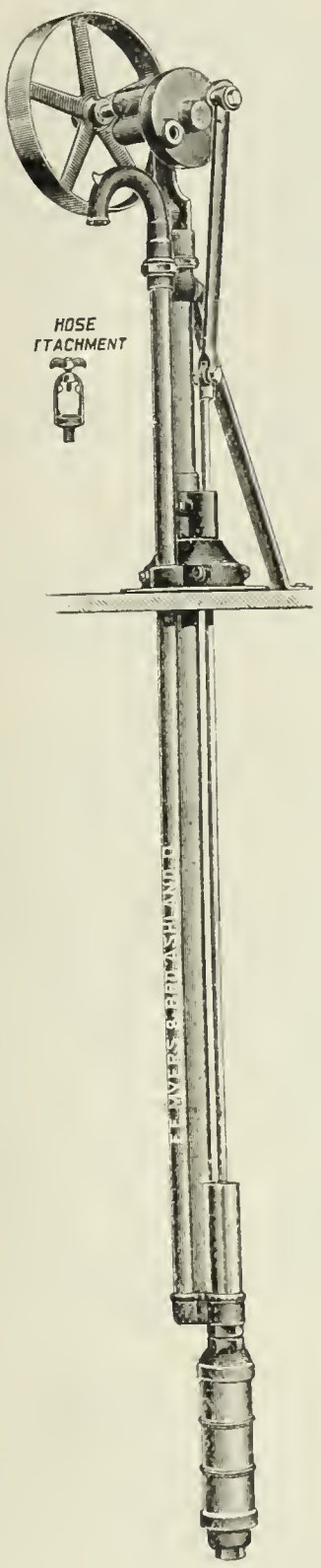
and 3 inch cylinders, all having 1¼-inch suction and 7-inch stroke.

A seasonable device is presented by the Cleveland Stamping & Tool Company, Cleveland, O., in the Lackawana Ash Sifter, which is illustrated in our advertising columns. It is designed to separate the coals from the

ashes in the ash pit of the furnace, so that dust is carried off by the draft. It is made in two sizes, and is said to be adapted for all kinds of furnaces.

Dairy and Factory Pump.

F. E. Myers & Bro., Ashland, Ohio, are introducing for dairy and factory purposes a pump, as here illustrated. It is referred to as light and back geared 2½ to 1, being



Force Pump for Dairy and Factory.

constructed on the form of their branch pipe pumps. It is designed to operate in any well having a depth of from 10 to 200 feet, and has 4, 5½ and 7 inch stroke. The construction is said to be the very best throughout, and the pump is offered with the belief that it will fill a requirement that has not been met—viz., a force pump with great power, so adapted as to operate in almost any depth of well, and all self contained.

The Baldwin Refrigerator Company.

The Baldwin Refrigerator Company, Burlington, Vt., are sending out their 1898 catalogue of Refrigerators, which is a very complete and attractive volume, and exceeds in size and appearance any of their former issnes. A large assortment of sizes and styles is shown, covering some 110 varieties, and including Soft and Hard Wood Refrigerators for residences, apartment houses, restaurants, grocers, hotels, &c.; also Ice Chests and Boxes. A large line of Sideboard Refrigerators in a variety of handsome designs are included in the catalogue. Illustrations are given of special Refrigerators and Coolers, such as the company build for hotels.

Combined Anvil, Vise, Drill, Pipe Clamp and Grindstone.

The accompanying engravings show the combined anvil, vise, drill, pipe clamp and grindstone which J. W. Cregan, The Bourse. Philadelphia, is putting on the market. Fig 1. shows the device with the drill and pipe clamp attachment. When it is desired to use the grindstone the

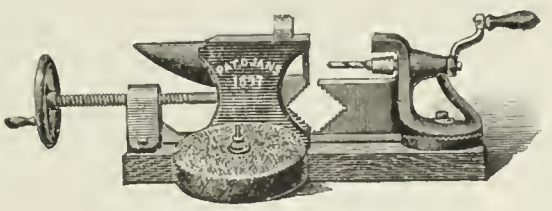


Fig. 1.—Combined Anvil, Vise, Drill, Pipe Clamp and Grindstone.

pipe clamp is easily withdrawn, as shown in Fig. 2. The drill is also easily removed when the pipe clamp is required for use. Fig. 2 shows the drill and pipe clamp detached and the grindstone in position and ready for use. When the tool is reqnired for boring heavy timbers, the back jaw or bearing end may be set to any desired angle, and is adapted for accommodating any size of auger bit. The device has been designed principally for the use

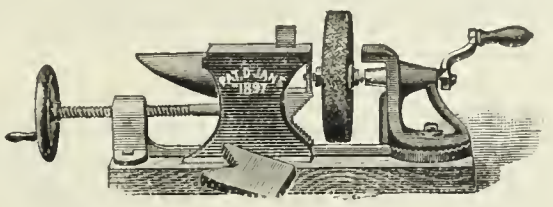


Fig 2.—The Grindstone in Use.

farmers and others frequently having odd repair jobs to execute and calling for the use of tools such as are found in this combination. The tool is neatly finished and painted with a dark varnish filler, and is made in two sizes weighing when crated 60 and 80 pounds respectively.

MEMORANDA.

Martin Bingman has opened a tin and general repair shop at Shelton, Wash.

J. E. Hutchinson has opened a tin shop at 710 First street, Hastings, Neb.

We regret to announce the death of James S. Hagerty, senior member of the firm of Keen & Hagerty of Baltimore, Md., the well-known manufacturers of Tinware. Mr. Hagerty died at his home in Baltimore on November 9 from a complication of diseases, after a comparatively brief illness, at the age of 68 years.

We are officially advised that the report that the business of the Wheeling Stamping Company, Wheeling, W. Va., manufacturers of Lanterns, Oil Cans and other metal specialties, and until June 1, 1897, known as the Nail City Stamping Company, will be consolidated with the business of a concern located in Bellaire, Ohio, is untrue. There is no intention of changing the present organization of the Wheeling Stamping Company.

John F. Weyand, wholesale and retail dealer in Hardware, Stoves, Tinware, Implements, &c., Pennsbnrg, Pa., expects soon to take possession of his new store.

J. D. Russ, retailer of Hardware, Stoves, &c., Rawson, Ohio, will remove to Arlington in the spring.

Opp & Davis have opened a new Hardware store at Weiser, Idaho. They are carrying a line of Heavy and Shelf Hardware, Stoves, Tinware, Agricultural Implements and Sporting Goods.

Huss & Batis, Arenzville, Ill., have opened up their new store and are now ready for business. They have added Stoves and Tinware to their former stock.

C. E. Krusen has sold out his Hardware business at Westfield, Pa., to F. E. Kinsman, formerly of Greene, N. Y. The stock comprises Hardware, Stoves, Tinware, Fishing Tackle, Guns, Paints and Oils.

C. H. Collins & Co. are a new firm at Le Sueur Centre, Minn. They are retailers of Shelf and Heavy Hardware, Tinware, Stoves, Agricultural Implements, Sporting Goods, &c.

TIN PLATES.

The American Tin Plate Company.

The magnitude of the works of the American Tin Plate Company, at Elwood, Ind., is forcibly indicated by the statement from official sources that the buildings for making tin plate placed end to end would extend 3100 feet. This only includes the black plate mills, tinning houses and their adjuncts, and excludes the new bar mill and a number of other buildings, which in themselves would form a plant of good size. In planning these works the managers of the company, with great forethought, made ample provision for the enlargement of each department if the growth of their trade would justify it. Their most sanguine expectations have been realized in this respect. Beginning with four hot mills, which was considered qnite a good plant at the time, they have enlarged in abont five years to 20 mills, with a daily product of about 250 tons of tin plates. This enlargement has been made, owing to the care taken with the original plans, without disturbing the symmetry of the works or the convenience of the initial relations of the several departments.

Demand for Ternes.

As bearing on the subject of the decline in the consumption of roofing plates, to which reference was made recently in these columns, the following observations by Charles S. Trench & Co. of New York in a recent circular are of interest:

The small demand for terne plates, less than last year and considerably below former years, has created some discussion. Many hold the opinion that the use of other materials and the character of buildings being erected indicate a change in the trade, but our investigations lead us to the opinion that the real cause is the continued stagnation in building operations in the smaller towns and country districts. Close investigation in three of the most important States, New York, Pennsylvania and Ohio, through a medium ot correspondence and travelers, has brought out the almost unanimous opinion that the falling off is due to the stagnation in the building trade, and this has been confirmed by the sellers of other roofing materials, whose experience in decreased sales has been identical with the tin plate trade.

SCRAP.

The Humbert Tin Plate Company's plant, at South Connellsville, Pa., is running steadily night and day, and is reported to have orders ahead until the coming spring at good prices. The difficulty experienced by many Tin Plate works in getting bars has not affected the company, as they have their steel bought to January 1 next.

A dispatch from Sharon, Pa., says that State Treasurer Haywood has donated a site for the proposed Tin Plate plant at that place and will become a stockholder in the company.

Commenting on the remarkable development of the American Tin Plate industry, as illustrated by the figures given in *The Metal Worker's* last quarterly lists, the London *Ironmonger* takes particular notice of the growing tendency in the United States for the manufacture of Tin Plates to be carried on in large plants and its combination with the manufacture of Bessemer or open hearth steel. This tendency, it believes, is bound to grow, seeing that the production of Tin Plates will provide an outlet for large quantities of steel which would otherwise be difficult to sell. In this plan our English contemporary sees a possible opportunity for the manufacturers of South Wales to preserve a large part of their declining trade, and it asks, Why do not some of the large Welsh steel works, such as Dowlais, Cyfarthfa, Ebbw Vale or Tredegar, go into this business and so preserve its old habitat?

At a recent meeting of the Welsh Tin Plate Workers' Union the president stated that 93 mills were working at reductions varying from 10 to 15 per cent., and 62 mills at promised reductions. The workmen at 154 mills had been asked to submit to reductions, but the employers had deferred the matter until after the council meeting. There were thus about 36 mills working on the list the workmen of which had not been approached by the employers for any reduction. The delegates finally agreed to the following resolution: "That, inasmuch as several leading works in the trade have given way to a reduction in wages, we propose that a reduction of not more than 15 per cent. off the 1874 list be submitted to in works where asked, to commence on November 1." It was then decided that a contribution of 2½ per cent. on all wages earned should be paid into the union funds, to support those works where more than 15 per cent. was demanded by the employers.

British exports of Black Plates for tinning in the nine months ended September 30, 1897, made a good showing, offsetting to some extent the decline in the exports of Tin Plates. They increased to 44,023 tons, as compared with 36,354 tons in the first three quarters of 1896, and 24,10 tons in 1895. Germany and Russia were the heaviest buyers.

The Neshannock Sheet & Tin Plate Company of New Castle, Pa., were granted articles of incorporation on November 4. The concern have a capital of $10,000 and the following directors: George W., William L. and C. H. Johnson and G. W. Hartman of New Castle and W. O. Kirkland of Beaver, Pa.

McGranahan & Faulkner, Wheeling, W. Va., have been awarded the contract for the erection of the new Tin Plate plant of the Laughlin Nail Company, Martin's Ferry, Ohio, and have begun preliminary work on the structure. The firm built the Tin Plate works of the La Belle Iron Works, at Wheeling.

The lease of the Stickney Iron Company's two-mill Tin Plate plant, at Baltimore, Md., by the Humbert Tin Plate Company, South Connellsville, Pa., is announced to have been definitely concluded. The lease runs for three years. The Stickney mills will probably be started up next week, and will be used to supply the local market.

The hammer shop of the Cumberland Steel & Tin Plate Company, Cumberland, Md., including the molding and blacksmithing departments, was totally destroyed by fire on Monday. The building was one story high, 100 x 55 feet, and contained four steel hammers and other machinery, besides a number of furnaces. About 25 men were employed in the building, but all had gone home. The other departments, however, were working at night, and when the alarm was given the employees, with the use of the fire fighting apparatus connected with the works, prevented the fire from spreading to the big mill only 15 feet away, which, if burned, would have been a loss of over $50,000. The loss is estimated at $10,000, and is fully covered by insurance.

The British Board of Trade returns place the total exports of Tin and Terne Plates from British ports to the United States in October, 1897, at 5036 tons, as against 4656 tons in the previous month and 10,590 tons in October, 1896. This makes the total exports of Welsh Tin Plate to this country in the first ten months of the current year 69,782 tons, a falling off of 31,341 tons as compared with the corresponding period last year.

The Totten & Hogg Iron & Steel Foundry Company of Pittsburgh, manufacturers of Rolling Mill Engines, Rolling Mills and Tin Plate Mills, have received an order from the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., to equip their plant with Freeman's Patent Furnace Charger for charging annealing furnaces.

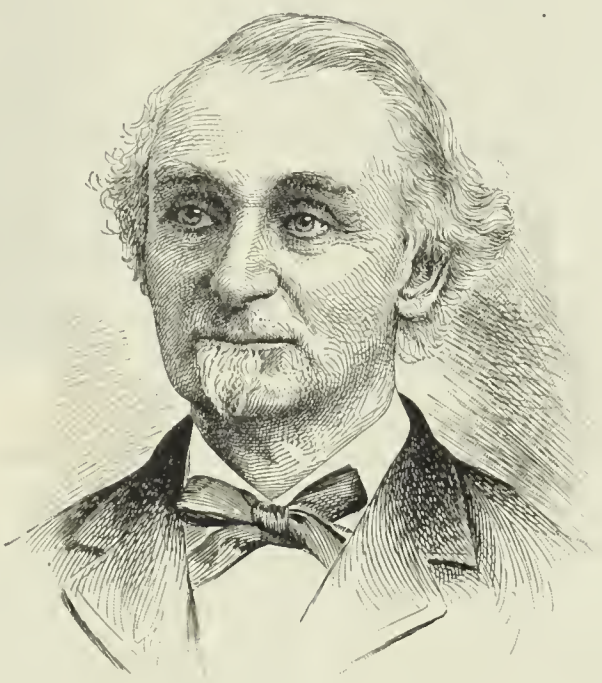
It is announced that the Atlanta Steel & Tin Plate Company of Atlanta, Ind., have decided to double the capacity of their plant. They have three hot mills at present. When the improvement is completed they will manufacture 2800 boxes of Tin Plate per week, and their monthly pay roll will be increased from $10,000 to $20,000.

A Washington dispatch states that the Government is now favorably considering the question of returning to the system of reciprocity in order to encourage our commercial relations with Canada. Mr. Kasson, who has been especially charged with the arrangement of reciprocity plans under the new Tariff act, is said to be in favor of such a course.

STOVE TRADE NOTES.

John Magee.

A wide circle of friends, both in and out of the stove trade, will learn with sorrow of the death of John Magee, which occurred at his home in Beverly, Mass., on Friday, November 5. He had been in poor health for several years and for some time past had been confined to his home on account of a stroke of apoplexy. He was widely known among the trade through his long connection with the Magee Furnace Company, and was in every way an example of New England probity and genius. Mr. Magee was born in St. Johns, New Brunswick, December 24, 1821. Before he was a year old his parents removed to Andover, Mass., where his boyhood was passed. His parents were poor and he was under the disagreeable but beneficial necessity of working from an early age in one of the large woolen mills of the place. At 16 he was advanced to the position of second foreman in one of the principal departments, but the business was evidently not suited to his taste, for about the time he became of age he left the mill and apprenticed himself to learn the tin, sheet iron working and plumbing trades. He made such progress that before the expiration of his term of apprenticeship he was given the foremanship of the entire shop. Later he established himself in the retail stove and plumbing business in Andover, and there he continued until he was 26 years old. At that time he started, in connection with a friend, a small woolen mill in Danvers. He remained in this business only about a year, and in 1849 went to California to search for gold. In 1852 he returned home and became superintendent of the tin and trimming department of the N. E. Glass Company of Cambridge. In 1854 he again started for himself in the retail stove and plumbing business in Lawrence, Mass., and at that time became desirous of making stoves, one which he invented being placed on the market in 1856 under the name of Diamond.



JOHN MAGEE.

For about five years Mr. Magee's stoves were manufactured for him, but in 1861 he was invited to become a partner in the concern which had made his castings. This he did and the firm were reorganized as the Norton Furnace Company. The principal foundry was at Norton, Mass., but part of the time another was run at Providence, R. I. In 1864 they began a foundry in Chelsea, Mass. The partnership formed in 1861 was dissolved in 1866, and in January, 1867, Mr. Magee started again with new associates, forming what was known as the Magee Furnace Company. His connection with the stove business always had to do with the practical part of it. For a long term of years he personally managed the work at the foundry, and gave his whole time to the production and improvement of stoves and furnaces. He took a very active personal interest in the production of the well-known Ideal stove, and found much pleasure and satisfaction in showing by a great variety of useful and ornamental art castings what beautiful results were possible in cast iron under good conditions and with good foundry management. Personally Mr. Magee was a man with rare charm, and the simplicity and sweetness in his character endeared him to all who knew him. During his whole connection with the stove business the idea of making money seemed to be furthest from his mind. He was determined that his goods should be fine in quality and superior in workmanship, and he was much more a manufacturer than a merchant. He was granted a large number of construction patents, besides a great many design patents, many of which have long since become public property and are now in general use, while others are exclusively employed by the Magee Furnace Company. Mr. Magee leaves two sons, Frank A. of Wenham and John of Chelsea. The funeral took place Monday noon at his home on Ober street.

William L. Bridgeford.

The stove trade of the country will learn with regret of the sudden death of William L. Bridgeford, which occurred at his residence in Louisville, Ky., on the morning of Wednesday, November 3, the trouble being an affection of the heart. About six weeks ago Mr. Bridgeford was attacked with a mild form of heart trouble, but for the first few days his condition was not regarded as critical. Pneumonia later developed, but he rallied and continued to improve until he was thought to be convalescent until Wednesday morning, when his condition suddenly changed for the worse.

Mr. Bridgeford, who was the senior member of the well-known stove manufacturing concern of Bridgeford & Co., was born in Louisville in 1847. His father, James Bridgeford, was the founder of the firm of Bridgeford & Co. and a man prominently identified with the business interests of Louisville for a period of over 40 years, being noted as a banker as well as a manufacturer. The son, William, entered his father's employ and by close attention to business soon raised himself to a position of importance, and for several years before his father's death, which occurred about ten years ago, was practically the head of the concern. The business, with other properties pertaining to Mr. Bridgeford, Sr., afterward passed into the control of the Fidelity Trust Company to be distributed among the several heirs, and when the stove plant was offered for sale it was purchased by William L. Bridgeford. He immediately reorganized the company, associating with him C. W. Adams of Somerset, Ky., and George Ogle, who for 30 years had been foreman of the tinning department. Mr. Bridgeford was a graduate of an American college and afterward went to Heidelberg, Germany, where he took a special course. He leaves a widow and four children.

The Weir Stove Company, Taunton, Mass., show a great deal of originality and good taste in the advertisements which they prepare and distribute widely in the local press in New England and through other publications. The firm for some years have had their own printing office, with two presses and a full assortment of standard and display types, where they prepare a vast amount of printed matter that serves to keep the Glenwood Stoves

and Ranges prominently before the public. The wording of the advertisements and the striking manner in which they are displayed are the result of R. H. Babbitt's genius in this direction.

PHILADELPHIA STOVE TRADE.

There is quite a steady movement of goods from the warehouses, and while individual orders are not of a bulky character there are enough of them to make the volume of business large. A bright feature of the trade is its steadiness in the absence of anything approaching cold weather. Already the amount of business done greatly exceeds the figures reached at this stage of the season last year, and there is every indication that the total business for the season of 1897-98 will equal and perhaps exceed that of 1895.

The demand for cast iron heating goods is, on the whole, satisfactory. The heavy demand for tamale stoves has, as might be imagined, affected to some extent the movement of cast iron heating goods and dealers are consequently placing orders for coal stoves for regular requirements somewhat cautiously. In view of the improved condition of the industrial classes, however, business in coal goods is expected to even up later on and leave little room for complaint.

Cooking goods are in active demand, but makers complain very much in regard to the low prices obtained. More particularly is this the case with shipments to the Southern market, where some lively competition is offered by Western houses. A sale recently reported as made by a Western concern, and occasioning much comment in this market, was one of a carload of cook stoves, of up to date style and attractive design, weighing, it is said, 130 pounds, well finished and desirable goods in every way, which were laid down at a point in Georgia at a cost to the buyer of $2.73 each. A similar stove had previously been sold in the same territory at a figure in the neighborhood of $4 85, laid down. Allowing for freight at an extremely low rate, these stoves must have left the factory at an invoice price of less than 2¼ cents per pound. Founders look upon the transaction as an example of extraordinary price cutting, and dealers who have heard of it naturally wonder where their profit is to come in on cook stoves to be handled in the future at such a low basis of cost. It is to be hoped for the sake of the trade that the shipment mentioned will not be duplicated unless at a profitable price, as 2¼ cents per pound for a finished cook stove is a price bordering upon the ridiculous.

The furnace trade is brisk. While the orders coming in from building operations are few, the business aggregating from individual householders installing new heating apparatus is large and increasing.

There is much complaint in regard to collections, which are reported to be exceedingly slow.

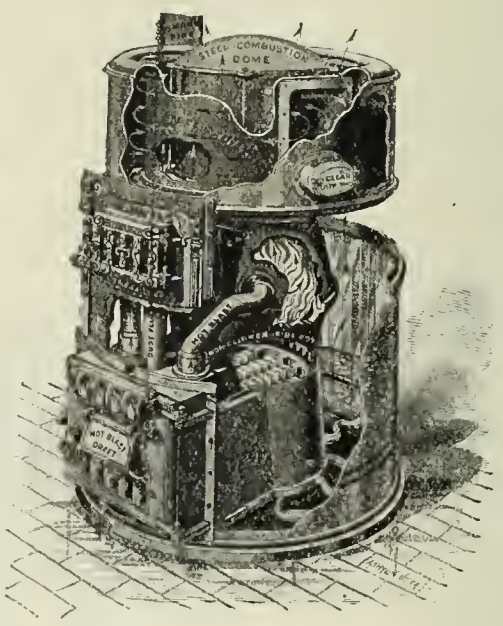
The Buckwalter Stove Company,

Royersford, Pa., are sending out new circulars covering some of their furnaces. The company claim to make a greater variety of styles of furnaces than any other maker in their State, and to have styles to suit all conditions at a wide range of prices. One circular describes the Eclipse, one of their leaders, a very heavy gas and dust tight furnace for hard or soft coal, powerful and self cleaning, special check damper and dust flue, and triplex grate ; another describes the Eclipse Duplex, said to possess more radiating surface than any other heater and to be the only furnace made with three radiating drums ; a third describes the Eclipse Junior, a low priced furnace in five sizes, having an inner dome made in a single piece casting, thus combining gas and dust tight construction with ample radiating surface, and adapted for burning hard or soft coal ; a fourth circular describes the Storm, a drum furnace in three sizes, with ten steel air pipes running through the drum, and the drum so designed that it can be mounted to make the furnace suit low collars. The company have studied the requirements of furnace dealers and users to an extent which has been much appreciated, and are consequently enjoying an increased demand for their products.

James Spear, a well-known Stove manufacturer of Philadelphia, Pa., says: " It is a singular thing that many architects and builders do not understand the construction of chimneys. Many of them plan a flue which is but a few square inches in size to carry away smoke from an open fire place whose dimensions may be a yard or more. It doesn't take a very bright mind to understand that when the smoke from a roomy fire place rolls up against a flue which is only a few inches square it is not all going up the chimney. Part of it is bound to be rolled back, and yet year after year houses are constructed with chimneys built in this fashion, and they often have to be torn out and reconstructed. A good chimney is one of the most necessary requisites of a dwelling, and too much care and thought cannot be given to its construction."

The New Superior Hot Blast Furnace.

A hot blast warm air heater which is especially adapted for burning soft coal has just been brought out under the name of New Superior by the Superior Foundry Company of Little Falls, N. Y. This heater, we understand, has been developed after two years of experimentation with soft coal, and the principal feature in its construction is the provision for "injecting into the combustion chamber above the fire pot a large volume of highly heated oxygen, which, mingling with the nitrogen gases, sulphur, tar and smoke arising from the fresh coal supplied, thoroughly ignites and consumes these gases, thus insuring a perfect combustion and coking the coal, which presents all the advantages of a hard coal fire." The New Superior embodies among other features a cast shield front, extra deep ash pit, non-clinker fire pot cast in two sections and fitted with Superior flat shaking and dumping grate, extra heavy cast iron dome, steel combustion chamber with large radiating surfaces, large ash pit door and mica rake off, with the company's new positive dust escape. The furnace castings are made extra heavy and the parts are carefully mounted, fitted and inspected before shipment. The New Superior is made in five sizes, having a diameter of grate ranging from 15 to 22 inches and diameter of fire pot ranging from 17 to 30 inches. The hight of the furnace ranges from 42 to 62 inches and the square feet of radiating surface from 36 to 78 inches, with a heating capacity stated to be from 10,000 to 60,000 cubic feet. The illustration of the heater which we present herewith shows it with the outer casing removed and some of the parts broken away, indicating the interior construction and the course of the air currents.

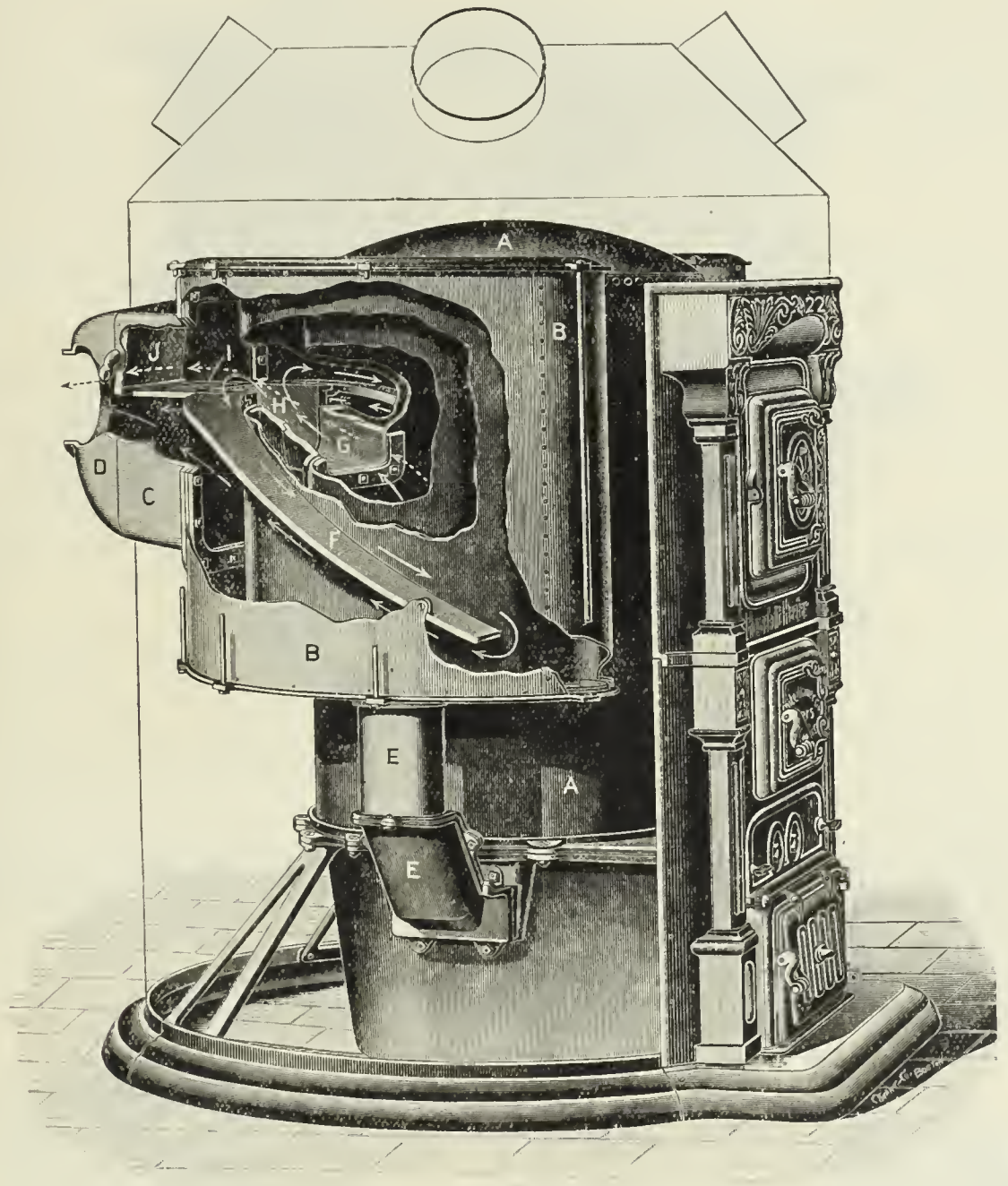


New Superior Hot Blast Furnace.

The Charter Oak Stove & Range Company, St. Louis, Mo., are in receipt of a somewhat unusual testimonial letter from J. T. Strother, Waco, Texas, who informs the company that he is using a Charter Oak Cook Stove which he bought in 1867, and that it has been fired up three times a day since that time to cook for a family varying from 6 to 20 in number. The Stove, which is of the pattern of 1853, improved in 1859, had been in use for one year before Mr. Strother bought it, so that its total life up to date is 31 years. Mr. Strother ends his letter thus : "Thirty-one years seems a long life for a Stove in active operation every day. But this Stove is, I believe, good for ten years to come. I shall name it in my will in connection with my youngest girl. The statements above given open the way for a little gratuitous advice, at which, I hope, under the circumstances you will take no offense. Advice : Cease making Stoves that last a lifetime, you'll ruin your business."

The Household Heater.

The engraving presented herewith is a broken view of a new hot air furnace known as the Household heater, manufactured and put on the market by the White, Warner Company, Taunton, Mass. H. A. Tinkham of the above firm has given a great deal of thought to the design and construction of this furnace, and the result is what he believes to be an unusually efficient and excellent form of heater. The main radiator A is described as made of the best quality of boiler iron with riveted gas tight joints. A particular feature of the heater is the auxiliary radiator B, which is referred to as something new in this style of furnace, adding greatly to its power. The manufacturers significantly state that it is made under Letters Patent No. 350,590, of which they are the sole owners for New England. Consulting the illustration it will be noted that in the auxiliary radiator is the deflecting plate F, which, when the direct damper J is closed, carries the products of combustion around this radiator in a downward course toward the front, then backward and rising to the outlet into the smoke pipe as shown by the arrows. The space between the radiators A and B furnishes a very efficient heating chamber, and with the other surfaces provides that all the cold air admitted to the furnace shall come in direct contact with hot surfaces. The clean out of the furnace is made large and roomy, so that all parts of the radiator can be reached by the opening in the back when the outside collar is removed. Another feature in the construction of this furnace which the makers allude to as entirely new and novel is the method of hanging the grate bars. By the method adopted they have done away with bolts, and yet allow the grate bars to be taken out and replaced in a few moments. This is accomplished by means of a cast hanger keyed in place by a pin, the hanger supporting the outer ends of the grate bars, two hangers swinging from either side being used for the entire grate. By simply removing the pin the hanger can be dropped and the bars can be taken out. Another detail to which attention is directed is the arrangement of the dust damper, which can be taken out and replaced by merely unscrewing a knob on the outside of the front, then placing the hand inside and removing the damper. The course of the products of combustion is clearly shown by the arrows in the engraving, the hot gases from the fire passing through the collar G connecting the fire chamber with the outer radiator. When the damper J is dropped the draft is direct to the chimney, and when raised it is thrown back and around through the radiator B. The plates G, H, I and F are made very heavy, and all except G and F can be taken out at the back when D is disconnected from C, which is readily done by taking out a couple of pins.



The Household Heater.—Broken View.

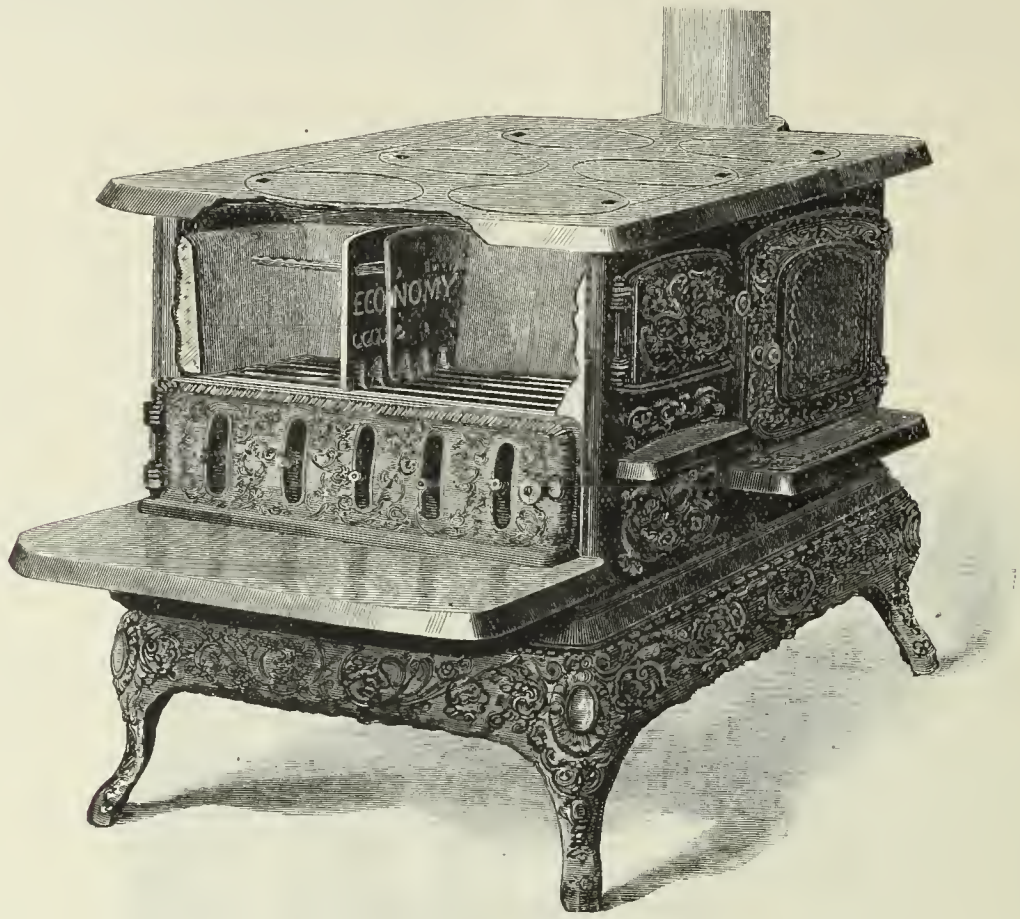
It will be seen, therefore, that in case of repairs the plates are easily accessible. The Household heater is made in a full line of sizes, and the manufacturers will be glad to furnish circulars giving dimensions, capacities and prices.

Good Western Trade.—Chicago stove houses report a much better trade since the opening of the month of November. Orders are much more numerous and shipments are hurried. Their collections have seldom, if ever, been better than at this time. Advices from Kansas City are to the effect that trade there is rushing, owing to colder weather.

The Detroit Furnace & Heater Company, Detroit, Mich., who have been building a new plant of largely increased capacity to take the place of the one lately destroyed by fire, will move into their new quarters on the 15th inst.

The Economy Adjustable Fire Box Partition.

A device for reducing the size of the fire chamber in cooking stoves for small work, or to do summer cooking, has been invented by W. G. Hamilton, Colorado Springs, Col., and is being offered for sale by Carleton M. Gilbert, whose address is P. O. Box 2490, New York City. A bro ken view of a stove is presented in Fig. 1, showing the Economy adjustable fire box partition in position. Fig. 2 is a general view of the partition and Fig. 3 is a sectional view. The partition consists of two cast iron plates so made as to be adjustable to the shape of the fire chambers of the various cooking stoves. The points at the lower edge of the partition are notched so that they may be readily broken off where they hinder the partition finding its natural resting place. In one part of the partition there is a slot, and in the other holes at the top through which a rod adjustable in length may be connected. In one plate there are a number of holes at the bottom which are designed to correspond with one of the holes in the other plate, so that it may be fastened by means of a stove bolt, as shown in Fig. 3, after the partition has been fitted to the fire chamber in which it is to be used. The rod used for holding the partition rigidly in place is provided with notches so that it may be broken off at the point desired. It is mentioned that the partition is adapted for use in all kinds of cooking stoves, and its application is so simple that it can be put in place by any one. It is further pointed out that a very material saving in fuel may be effected by the use of only a part of the fire chamber for light cooking, and that when there is no fire under one of the cooking holes there is sufficient heat radiated from the partition to boil water. It is specially adapted for summer use where the heat in the kitchen becomes intolerable if the entire fire chamber must be used.



The Economy Adjustable Fire Box Partition —Fig 1.—Broken View, Showing Partition in Place.

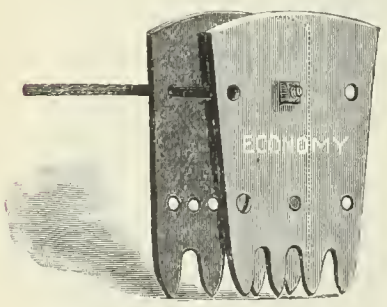


Fig. 2.—General View.

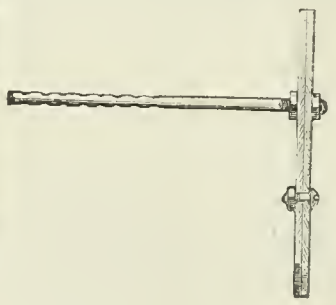
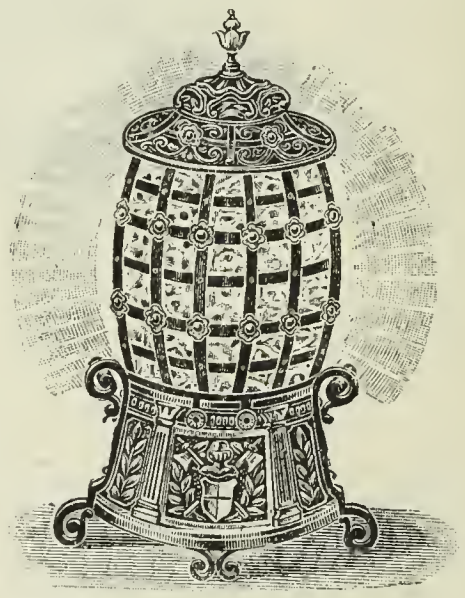


Fig. 3 —Sectional View.

A Fire Basket Stove.

One of the forms of heating apparatus intended for use in halls, bedrooms, bathrooms, &c., which has recently been brought out by an English manufacturing concern, is what is known as a Fire Basket stove, a general view being presented in the accompanying illustration. This stove is constructed with a strong cast iron tank in one piece, and in the words of the manufacturers "is fitted with patent Tundish and filter, mica chimney, fluted ruby envelope, asbestos fire balls, wrought iron basket, polished copper rosettes, ornamental cast iron top and cast iron kettle rest." The tank has a capacity of 3½ pints, and it is stated that it will burn for six hours. The hight over all is 29 inches, and the width 18½ inches. The stove is fitted with the manufacturers' duplex central draft double 4¾ inch burners, constructed on the most approved principles, and which are said to be free from smoke or smell. They give a powerful heat, and the effect is that of a mass of glowing coals.



A Fire Basket Stove.

The Cook & Van Evera Company, Chicago, are distributing very pretty picture cards with descriptions of their Ranges and Stoves, printed on the reverse side. The goods to which attention is thus called are the Jersey

Steel Range. the Jersey "A" Cast Range, the Jersey "H" Cast Range, the Jersey "K" Cast Rangc, the Jersey "F" Cook Stove and the Jersey "G" Cook Stove. The Jersey trade-mark is quite a conspicuous feature of these cards.

ODD PLATES.

"The Comfort of Heating by Gas" is the title of a neat pamphlet issued by the Consolidated Gas Company of New York which shows by means of illustrations how Gas Grates, Gas Logs and Gas Radiators may be used for heating any room in a residence. It also shows Gas Water Heaters and apparatus in use for doing kitchen and laundry work.

The Schill Furnace & Range Works, Crestline, Ohio, although started in 1892, have repeatedly been compelled to enlarge their productive facilities, and the company attribute this to the fact that their productions have met the approval of the trade. The Centennial Exposition just closed at Nashville, Tenn., has awarded them a gold medal for the best Furnaces and Steel Ranges, together with diploma of honor for the best construction of Warm Air Furnace and Steel Range. The company have been compelled to increase their operative force by the addition of a score or more men by reason of the demand.

As one of the conveniences to their new plant the Detroit Furnace & Heater Company, Detroit, Mich., have asked the authorities to allow a railroad siding to be run to their buildings.

William N. Jarden succeeds to the Mantel and Grate business formerly carried on by Jarden, Young & Co., at 35 South Seventeenth street, Philadelphia.

The Eddy Electric Mfg. Company, Windsor, Conn., publish circulars illustrating and describing their Electroplating and Electrotyping Dynamos. These are shown by very fine half-tone engravings and full descriptive particulars are given in the circulars. The plating machines are made in four different sizes. All those who are interested in plating will do well to secure a copy of the circular, which will give them information about these high grade machines.

In the description of the Waste Heat Radiators made by the Waste Heat Radiator Company, Buffalo, N. Y., published in *The Metal Worker* of November 6, we were in error in stating that when they are adapted to a hot air furnace the air is either taken from the cellar cold air box or through a pipe from an opening in the room above. This statement was incorrect, for with the Waste Heat Radiators air is never taken from a cold air box, but always from the room or floor above.

The recent destruction by fire of the Bonnet-Nance Stove Company's works at Quincy, Ill., is stated to have been the fourth severe loss which has been visited on this plant. The first was the burning of the old works of Bonnet, Duffy & Co., many years since. The second was the wrecking of the works by a cyclone in 1881, and the third was a serious fire in 1882. The patterns recently destroyed were extremely valuable, being estimated to represent at least $50,000. The books and valuable papers were saved.

John G. Smith, a well-known citizen of Peekskill, N. Y., died after a lingering illness at his home, 62 Hudson avenue, on the afternoon of Friday, November 5, aged 51 years. He was born in the city of Buffalo, December 16, 1846, and went to Peekskill 27 years ago, where he has since resided. He was for a number of years employed in the mounting department of the National Stove Works.

The annual meeting of the Equity Protective Stove Association of the United States was held at the Troy House, Troy, N. Y., on Thursday, November 4. Among those present were William E. Hogan of Troy, C W. Curtis of Rochester, N. Y.; Charles S. Prizer, Reading, Pa.; B W. Kinney, Boston, Mass.; Nicholas Brayer, Rochester, N. Y.; William Smith, New York City; E. T. Anthony, Boston, Mass.; Henry Cribben, Chicago, Ill., and W. C. Higgins. Questions relating to the Stove business were discussed, and the annual election which took place resulted in the choice of Charles A. McLeod as president and E. T. Anthony of Boston as secretary and treasurer. The visitors were entertained and given luncheon at the Troy Club.

The Michigan Stove Company are distributing printed matter which is well calculated to arouse interest among Stove dealers in all parts of the country. The approach of Thanksgiving Day presents a most excellent opportunity for calling the attention of all housekeepers to the advantage of having good cooking apparatus for the purpose of furnishing their respective households with the finest meals of the year. It is "the time of times" to sell cooking Stoves and Ranges. Good living is associated with Thanksgiving Day as with no other day in the calendar. To assist Stove dealers in evolving plans by which to take advantage of this season, the Michigan Stove Company have prepared a large sheet on which they have reprinted from the trade papers a number of articles on this subject, giving practical suggestions relative to pre-Thanksgiving advertising. They also furnish a large brown paper poster on which a marking brush is cleverly imitated in advising the reader that "Thanksgiving turkeys should be cooked upon Garland Stoves and Ranges. Surprise your family by making a selection now." On another sheet they furnish prints of various sizes of their trade-mark, and offer to furnish the cuts free for local advertising.

NEWS AND NOTES.

The railroad freight rate war is so pronounced in the West that the traffic officials of the Western roads have given up all idea of having rates restored to a normal basis in the near future. They say that as long as there are so many roads operating outside the Joint Traffic Association there is little or no prospect of maintaining anything like uniformity in freight rates, and many are of the opinion that the only remedy for the present demoralization will be the passage of a pooling law by Congress at its next session.

Some time ago a law was enacted by the New York State Legislature requiring that all stone for State and municipal work, except paving blocks, should be worked, dressed and carved within the limits of the State, and that a clause to this effect must be inserted in all municipal and State contracts. The unions in the iron industry in the State of New York have now started a movement for the passage in the next Legislature of a similar law in the interests of the iron trades.

Secretary of the Navy Long has recommended the purchase by the Government of $1,000,000 worth of smokeless powder for reserve purposes.

M. Osiris, a well-known French philanthropist, has deposited at the Bank of France a sum of $20,000 as a prize for the exhibitor in the Paris Exposition of 1900 of the most meritorious work from an artistic, industrial or humanitarian point of view.

The Secretary of the Navy has declined to grant the request of the Columbian Iron Works of Baltimore, Md., that the contract requirement for speed in the case of the two torpedo boats now in their hands, the "Rogers" and the "Winslow," be reduced 2 knots per hour. The boats are now required to make at least 24½ knots per hour, and the department officials hold that this can be gotten from the craft as designed if the boats are properly handled.

So rapidly is the traffic increasing in the new railway line between Tien Tsin and Pekin, China, that it has been found imperative to put down an additional track.

It is reported that the London & Northwestern Railway Company of England have decided to cut a tunnel 10 miles long through the Shap Fells in the north of England in order to secure more rapid transit between England and Scotland.

A large new steel plant is being erected at Blizyn, Russia. It is expected to be ready for operation before the end of the year.

A dispatch from San Francisco, Cal., announces that Sumatra kerosene is likely to become an active competitor of the Russian and other oil in Japan. Recently a Yokohama firm ordered over 40 000 cases of Sumatra oil, and this is understood to be only the beginning of a business which is likely to be largely developed. The Sumatra oil is said to be quite as powerful as Russian kerosene, and the supply of it is believed to be practically inexhaustible.

An extraordinary showing is made by the Chicago, Burlington & Quincy Railroad Company, in reporting their earnings for September. As compared with September of last year their gross earnings increased $1,249,693, while their surplus over all expenses and charges increased $649,130. This system runs largely through the great corn belt. The improved condition of business is shown in the growing scarcity of good workmen. Employers of labor are finding increasing difficulty in securing all the men they need. The country is therefore at last utilizing its surplus human energy, which was a serious burden to carry during the depression.

The steamship "Milwaukee," which sailed from New Orleans on Monday for Liverpool, England, carried the largest cargo of cotton, and probably the largest general cargo, ever floated. It consisted of 23,850 bales of cotton, 30,200 bushels of corn, 38,818 pieces of staves and 2300 oars, the entire cargo occupying a space about equal to that of 500 freight cars, or a train measuring 3¼ miles in length.

TRADE REPORT.

METAL MARKET.

Pig Tin.—In wholesale prices there has been no wider fluctuation than 10c. per 100 lbs. during the entire week, and values at this writing stand almost exactly as they were a week ago. Speculation has remained dormant, and large dealers have operated in a very conservative way. Consumers and the out of town trade have taken quite their usual quantity of the metal, however, and thus prevented any burdensome accumulation in importers' hands. Jobbers' prices are unchanged for small lots from store, Straits Pig being quoted at about 14¾c. per lb.

Copper.—The position of the market is very much the same as it was a week ago. Sellers make some showing of indifference to the continued slackness of the demand, but orders are being competed for a little keenly, and none of remarkably full volume have been secured. In fact, both export and home trade buyers seem to be holding off at the moment, their near future wants being well covered. The restricted export trade is attributed in large measure to the engineers' strike in England. Retail business has not exceeded very moderate proportions and prices of small lots from stock remain at last week's level, namely, 12c. to 12¼c. per lb. for Lake Ingot and 11c. to 11¼c. for Ansonia Grade Casting Copper.

Sheet Copper.—The demand for this material shows little activity. Orders are rather spasmodic and irregular and are mainly confined to supplying present requirements. Prices are not quite as firm as they were, although 15c. per lb., basis, is generally quoted by dealers for small quantities from stock.

Pig Lead.—Operations have been on a very moderate scale and the demand from all quarters is slow at the present time. The offerings, on the other hand, are fairly large. Wholesale prices have receded about 5c. on 100 lbs., owing to this more or less adverse condition of affairs, and jobbers have also reduced their quotations on small lots to 4⅛c. to 4⅜c. per lb.

St. Louis advices are as follows: Pig Lead metal is a trifle weaker than last reported. The decline in price is sympathetic to a certain extent, as stocks in both consumers' and producers' hands are extremely light, and any heavy buying would send the price rapidly upward. The largest consumer in this market is reported to be almost bare of stock, and it is stated is buying in a quiet way all the Lead that is offered. If this condition exists, and the straws seem to point that way, a higher range of prices must shortly ensue.

Lead Pipe and Sheet.—A good deal of complaint is heard among manufacturers and dealers in these materials of the dullness at present existing in the demand. Consumers are buying little beyond what they need for present use and that is quite moderate in total amount. Eastern manufacturers and dealers quote Lead Pipe at 6c. and Sheet Lead at 7c. per lb., subject to the customary discount.

Spelter.—The demand has been moderate and dealings were confined mostly to small lots for early delivery. Wholesale prices have varied to a slight extent only, but appear rather weaker. The combination of Western makers has been dissolved. This combination included some of the leading makers in the Kansas-Missouri and in the St. Louis districts, but did not embrace all of them, nor the works of the Chicago district. While it had a good deal of power, it did not have control at any time. In a retail way sales were of very ordinary type and jobbers' prices show no variation, good Western Spelter in small lots being quoted at 4 65c. to 4¾c. per lb.

St. Louis advices are as follows: The agreement among Spelter manufacturers having been discontinued, prices are less firm in consequence. Stocks are not heavy in either consumers' or producers' hands, and the general opinion among manufacturers is that while market may ease off a trifle no serious decline in prices is anticipated.

Antimony.—A quiet jobbing business of a steady character is reported. Prices are held quite steady at 8½c. to 8¾c. for Cookson's, 7¾c. to 8c. for Hallett's and 7¼c. to 7½c. for Japanese in small parcels from store.

Nickel.—Prices remain at about 38c. per lb. for small quantities.

Tin Plate.—Another disappointing week has been experienced in the Tin Plate trade. No improvement has taken place in the demand from any quarter, except for American makes for comparatively distant future delivery, in which some moderate sized orders were booked, though at a low range of prices. Spot business was of very meager proportions. The absence of activity in the demand has made the market somewhat unsettled, but the lightness of available stocks and the delay in deliveries by the mills have prevented any absolute break in prices. These, however, are as low as at any time, with no immediate indications of rising. The retail trade, locally, has been fairly active, but the call for Roofing Plates was much below the average for the season. Jobbers' quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates continue dull and quotations are merely nominal. The available stock of imported material is very narrow.

The following statistics published by Charles S. Trench & Co of New York, under date of November 11, 1897, are of considerable interest as bearing on the production and consumption of Tin Plate in the United States:

Tin Plate and Black Plate Statistics.

1896.

Imports.	Cwts.	Estimated American outfit. Cwts.	Total available supply. Cwts.
January	354,142	224,000	578,142
February	213,991	230,600	444,591
March	164,391	243,360	407,751
April	204,602	300,800	505,402
May	226,414	292,400	518,814
June	190,936	346,360	537,296
July	229,158	209,500	438,658
August	231,324	270,400	501,724
September	159,911	323,900	483,811
October	161,086	343,200	504,286
November	115,832	329,700	445,532
December	110,194	303,500	413,694
Total 1896	2,361,981	3,417,720	5,779,701

1897.

Imports.	Cwts.	Estimated American outfit. Cwts.	Total available supply. Cwts.
January	163,718	322,800	486,518
February	171,347	330,500	501,847
March	229,457	378,400	607,857
April	193 674	391,100	584,774
May	144,853	428,300	573.153
June	132,502	424,500	557,(02
July	140,887	273,000	413,887
August	104,478	392,800	497,278
September	82,800	455,500	538,300
Total January 1 to October 1, 1897	1,363,716	3,396,900	4,760,616
Total same period 1896	1,974,869	2,441,820	4,416,689

In regard to the above figures Trench & Co. remark as follows: "The Tin Plate trade has not yet shared in the revival in business noticed in other directions and prices are as low as at any time. The above statistics indicate only a slight increase in the consumption, and this increase seems to have been almost entirely Black Plates, and it is doubtful if the actual consumption of Tin Plates is any larger than last year. The pack of canned goods and the roofing trade have shown a smaller volume in 1897 than in 1896. The coming year promises to show a decided increase in the consumption, as the present high prices for canned goods caused by this year's short pack will undoubtedly lead to a heavy pack next season, while the use of Black Plate is certainly rapidly increasing."

A special London cable dispatch of November 10, 1897, reports on the British Tin Plate market as follows: Tin Plate is steady at about 9s. 6d., f.o.b., for ordinary Cokes and corresponding prices for other kinds. Makers are well engaged, and there is improved inquiry for both Bessemer and Siemens Cokes. The stock at Swansea is estimated at 109,000 boxes.

Sheet Iron.—The demand, except for certain gauges of thin Sheets, has fallen off to some extent and prices are hardly so well sustained as of late. The mills, however, are still considerably behind in deliveries on Black Sheets, and this fact helps to prevent any marked decline in prices. For prompt deliveries they continue firm, but some shading is being done on orders for future shipments. Galvanized Sheets are not in quite as active de

mand as Black Sheets and mill prices are a shade easier. Jobbers in this section quote small quantities from stock at 2.35c. to 2.40c. per lb. for No. 27 Common Black Iron and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: The demand for mill shipments is best in Black Sheets. Inquiries are being received from unexpected sources, which is rather surprising, as the season is now far advanced. Mills are still far behind in deliveries. The easier terms now prevailing may be attributed to cuts in freight rates rather than lower prices named by mills. Galvanized Sheets are not in such good shape as Black Sheets from manufacturers' standpoint. Jobbers are well supplied with contracts and new business for the mills is rather quiet. Consumers are having as much difficulty as ever in securing shipments from mills and stocks here in branch houses are very badly broken. Small lots from stock are quoted at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

THE IRON MARKET.

Conditions in the Iron trade, on the surface, have changed very little. The present and the near future are taking care of themselves very well and the plants are busy still with the very large orders taken some time since. But it is true that the amount of business in the order books is steadily diminishing, showing either that buyers are holding off for future delivery or that consumption itself has been declining.

The feeling in the trade is that to some extent the latter is the case, but it is not creating any alarm, since the conviction is still general that in 1898 we are to have a year of heavy consumption.

Those who have been hoping for a very substantial advance in prices—and in their hearts the great majority have harbored that feeling—are drifting toward the conclusion that there will be no boom, with its chances of extraordinary profits and its long trail of disappointments and losses. In fact, doubts are being expressed whether costs will go up quite as much as has been expected. There have been advances in wages, and it is pretty certain that there will be quite a general readjustment in that direction. Whether all will pass over smoothly in that respect with some important concerns remains to be seen.

The monthly blast furnace statistics of *The Iron Age* show that we are getting close to the maximum record of the close of the "soda water rise" of 1895, with a weekly output of 208,500 tons of Coke and Anthracite Pig Iron, an increase of 13,000 tons since October 1. In spite of this heavy production, stocks have declined 34,000 tons in October, thus showing that lately at least we were taking all we were making. There is very little reserve capacity left which could get started without much trouble in covering Ore and Fuel. Even if successful the best of the idle plants would find little temptation in the way of dividends at prices now prevailing.

The volume of new orders for Finished Iron and Steel has not been large. Southern furnaces have had a rather quiet week.

Pig Iron.—The New York market has been quiet, and in some instances founders who produce goods for which the season is now past are stopping shipments. The feeling is that the trade must now go through the usual dull spell of early winter, and that little activity need be expected before the new year is well opened. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $11 to $11.25; No. 2, $10.50 to $10.75; No. 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

In the Philadelphia market, the indications of dullness noted a week ago appear to be confirmed, as buyers show very little disposition to do business. Prices are fairly steady and inside quoted rates are maintained, but the volume of business is much smaller than it has been and consumers are evidently waiting to see if they can get in on better terms before bidding for next year's deliveries. It is difficult to take any decided position in regard to values, although the general impression is that there will not be much change in either direction. Temporarily there may be a little weakening, but the final turn will necessarily be in accordance with the cost of production. Sales have been mostly in small and medium sized lots, but it is noticeable that deliveries are promptly called for, so that furnaces are tolerably free from accumulations. General quotations for seaboard deliveries are about as follows, with the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75 to $11; Bessemer, $12.25 to $12.75.

Southern sales agents in the Chicago market have had an exceedingly quiet week. They report that most of their customers have enough Iron under contract to cover their needs for some time into the future, and those who have not believe that they will lose nothing by deferring the making of contracts. Some grades of Southern Iron are very scarce, especially Soft Irons. The demand for local Iron has not been confined to small lots, but some good large contracts have been placed. The prices realized were fully up to our quotations, which is quite remarkable considering the lower quotations on Southern brands. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

There has been little done in Pig Iron in the Pittsburgh district during the week. Foundry Irons were specially quiet. We quote as follows, f.o.b. Pittsburgh: No. 1 Foundry, $11 to $11.25; No. 2, $10.50 to $10.75; No. 3, $10 to $10.25; Bessemer, $10.25 to $10.30.

The conditions in the Cincinnati market as outlined in last week's report remain practically unchanged. There has been no new business of consequence transacted in Pig Iron circles. A moderate, and perhaps normal, under the circumstances, run of small orders has continued and promises to hold unchanged for some time to come. The volume of inquiry is small and general conditions are very quiet. Consumption is good and furnaces and railroads are being continually urged to expedite shipments. Prices are nominally unchanged, and while furnaces are professing great strength and are admittedly in a strong position, yet it is a question as to how the market will open when the buyers again present themselves. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The St. Louis market is in about the same condition as last noted. Sales are not very good, mostly confined to carload lots for immediate delivery. There are no large buyers in the market and none are looked for until after the turn of the year. Stove works continue to be busy, but the season is drawing to a close and their requirements for the balance of the year are likely to be moderate. Prices are all maintained, and this, in the face of the liberal sales of warrant Irons at reduced prices, is a splendid indication that the market is in good shape. Stocks in the hands of furnaces are being rapidly depleted. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.50 to $11.00
Southern, No. 2 Foundry	10.25 to 10.50
Southern, No. 3 Foundry	10.00 to 10.25
No. 1 Soft	10.25 to 10.50
No. 2 Soft	10.00 to 10.25

CHICAGO REPORT.

Scrap.—The demand is subsiding and prices are lower. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$6.75	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3 75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c.	2.50	....
Old Boilers—whole (Iron)	4.00	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.75	....
Old Gas Pipe and Boiler Tubes	5.75	....
Cast Borings	3.25	....
Turnings	4 50	....
Horseshoes	9.50	....
Copper Wire and Heavy	....	9¾c.
Copper Bottoms	....	9 c.
Copper Clips	....	9½c.
Red Brass	....	7½c.
Yellow Brass	....	6½c.
Light Brass	....	4 c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	⅜c.

Anthracite.—The demand is a trifle better, but prices are weak. The card on carload lots of 12 tons minimum is now as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill.	$5.35	$5.60
Milwaukee, Wis.	5.35	5.60
Kansas City, Mo.	7.35	7 60
Council Bluffs, Iowa.	7.35	7.60
Lincoln, Neb.	7.50	7.75
Sioux City, Iowa.	7.85	8.10
Aberdeen, S. Dak.	8 60	8.85
Dubuque, Iowa.	6.65	6.90
Madison, Wis.	6.85	7.10
St. Paul, Minn.	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa.	7.35	7.60
Davenport, Iowa.	6.65	6.90
St. Joseph, Mo.	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb.	7.35	7 60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

The market shows little change in its general features since our last review. The volume of business is not very steady and uniform, but rather spasmodic and fluctuating, and on the whole perhaps slightly diminished. In some parts of the country, however, there is a good deal of activity, and the advent of cold weather has the effect of stimulating business, especially in winter goods. Prices are without material change, there being few fluctuations to report. The tone of the market is steady, prices being as a rule very well maintained, and in some lines there is evidence of strength, with something of a tendency to advance. In others there is a slight wavering. Reports from the different parts of the country indicate a gradual improvement in the condition of local business, there being promise of a marked increase in building and of renewed enterprise in many directions. It is anticipated that during the remainder of the year there will be a fair movement of goods considering the season, but the attention of the trade is turning more hopefully to the business of 1898. In the meantime both manufacturers and merchants are pretty well occupied, but, as is usual in the closing months of the year, attention is given to questions connected with business management and the policy to be pursued in the changing conditions and circumstances of trade. At the present time there are many problems calling for solution, especially because of the tendency to closer relations between the producers and consumers of goods, and the rapidly increasing prominence in the market of catalogue and supply houses and department stores. These are subjects which, while perhaps most immediately affecting the retail merchant, have also an important bearing on the business interests of both jobbers and manufacturers. At the coming meeting of the National Hardware Association, which will bring together representatives of many of the leading wholesale houses of the entire country, there is little doubt that these questions will receive attention, and the associations of retail merchants in different States will continue their efforts to remedy the existing evils, calling upon both manufacturers and jobbers with whom they have business relations to aid them in these endeavors.

Advices from Chicago.—The Shelf Hardware trade is running along at about the same rate as in previous weeks. Some localities are sending in very good orders for all kinds of goods, while trade with others appears to be absolutely dead. The weather is doubtless an important factor at this time of the year and the localities having colder weather are finding their trade stimulated. Jobbers are inclined to make some concessions on staple goods in order to reduce their stocks in anticipation of the slack times which may be expected until after the new year. They are at the same time anxious to see manufacturers advance prices on such lines of goods as are closely connected with Iron and Steel, believing that this would have good effect on all classes of trade. The deep cut in Western freight rates is expected to be of some benefit. Manufacturers of Tinware are enjoying a remarkable business when the quietness in other lines is considered. More orders are coming in for carload lots. The demand for better goods is also a striking feature. An instance of this is seen in the much heavier trade done in such articles as Wired Dish Pans and Enameled Ware. A very heavy business is still being done in Gold Pans for the Pacific Coast. Heavy Hardware seems to be getting better instead of worse. Collections in all branches of the Hardware trade are much better than they have been, showing a good condition financially throughout the country.

Advices from St. Louis.—The demand for Shelf Hardware continues to show a steady improvement. The lifting of the quarantine in the South has had a most beneficial effect on trade and orders from the South have been pouring in for a week past with no present signs of diminishing. The demand from this section comes at an opportune moment, as the West and Northwest had already supplied their wants and some complaints of dulness were beginning to be heard, and dullness generally paves the way for lower prices. The demand from the South is, therefore, doubly welcome, and prices which gave evidence of being shaky a week or ten days since have now recovered and are likely to be maintained during the balance of the year. The scarcity of Black Sheets continues and prices are being firmly maintained. Galvanized Iron is active. The recent advances made in Carriage and Machine Bolts and Lag Screws are being well maintained, and the gentlemen's agreement among the Bolt manufacturers is showing more stability than was anticipated. The general situation is now quite satisfactory, and unless something unforeseen occurs November and December should prove good months in the Hardware trade.

NOTES ON PRICES.

Wire Nails.—There continues to be a fair but not especially heavy movement of Nails, and notwithstanding rumors which are current of intended concerted action among the manufacturers there is little if any speculative buying. The tone of the market, in fact, is not especially strong. New York quotations for small lots from store are about $1.65.

Advices from Chicago.—New business is somewhat slow at present, but there would appear to be no special occasion for any weakness. The local market, however, has gone off somewhat, on account of the pressure to sell by jobbers. They have larger stocks or heavier contracts than they wish to carry through the remainder of the year, and are making inducements to retailers in order to move them. Jobbers' prices, therefore, are not in line with manufacturers' quotations. Jobbers sell small lots from stock at $1.50 in some cases, although $1.55 is more regular, and sales are reported up to $1.60.

Advices from St. Louis.—The market shows some signs of weakness, which, however, is largely confined to the jobbing trade, who bought liberally and are becoming impatient on account of the refusal of prices to advance, and rather than carry their stocks of Nails are shading prices somewhat to cut them down. Jobbers are generally asking $1.60 to $1.65, base, for small lots.

Cut Nails.—The market has been somewhat sluggish, with a moderate volume of business. There seems to be, however, a disposition to use Cut Nails for some purposes instead of Wire Nails, which for some time have taken their place, it being generally recognized that for certain uses the Cut Nails are superior. The market both East and West is at present an open one. New York prices for small lots from store are $1.40 to $1.45.

Advices from Chicago.—Small lots of Cut Nails are moving in a moderate way at $1.45.

Advices from St. Louis.—The market is quiet, and sales are unusually light. Jobbers are asking $1.55 for less than carload lots.

Barb Wire.—There is little change in the Barb Wire Market. The demand has perceptibly diminished and prices remain as before.

Advices from Chicago.—Prices are being held firmly by manufacturers and jobbers. Old orders keep the mills busy, and they will also soon have to stock up for spring shipments. Rods are scarce and dear and stocks are not pressing heavily on jobbers, as in the case of Wire Nails. Prices are therefore steady at $1.60 for Painted and $1.90 for Galvanized in small lots from stock.

Advices from St. Louis.—The movement in Barb Wire is limited and no improvement is looked for until after the turn of the year. Jobbers quote $1.60 to $1.65 for small lots of Painted and $1.90 to $1.95 for Galvanized.

Smooth Wire.—The demand for Smooth Wire is limited and prices are unchanged.

Freezers.—Manufacturers of Ice Cream Freezers are announcing their prices and beginning to book orders for next season. Their quotations are not materially different from those which prevailed last season, the general conditions not justifying an advance in prices, and the fact that the goods have been sold at narrow margins of profit making it unwise to lower prices. On account of the exceptionally cold and wet weather which prevailed last spring and summer the sale of Freezers was somewhat

curtailed. An abundant ice crop throughout the country and seasonable weather are referred to as likely to give an excellent trade in this line during the coming year.

Shot.—Under date November 1 Markle Lead Works, St. Louis, issue a circular in which they state that having caught up with their orders they are now quoting $1 base per 25-pound bag, f.o.b. St. Louis. They explain that this is not a card price, but a quotation with no further discount or allowance for cash or freight. Orders without specifications will not be accepted, and no order for less than 80 bags will be considered. With the considerable divergence of quotations now current in Shot, as made by the manufacturers East and West, the market is in an irregular and somewhat demoralized condition.

Glass.—It is probable that on or about November 15 Glass jobbers will receive official notification of the existence of the American Glass Company—the new single Glass agency—at which time it expects to begin operations. A new price-list of American Glass is expected to supersede the present one, which with new discounts will advance prices. While no definite statement has been made as to the advance, rumor has it that the new prices will be equivalent to about a 25 per cent. advance over present prices. Under the circumstances so radical an advance is certainly uncalled for, and would be likely to open up the way for an increased importation of foreign Glass. It is true that Glass is scarce, and that it is becoming more so every day that the resumption of the factories is delayed. The scarcity of Glass has had the effect of giving a firmer tone to the New York market, and has resulted in an announcement of a further advance in jobbers' discounts on small lots to 60 and 5 per cent. New York quotations on imported Glass continue 80 and 20 per cent. discount. Chicago jobbers' price for American Glass is 60 and 10 per cent. discount, except for 16 x 20 single strength, this size being 60 per cent. discount. It is anticipated that a further advance of 5 and perhaps 10 per cent. will take place.

White Lead.—There have been no really new developments in the market. Jobbers have, to all accounts, put out as much stock as they usually do at this season of the year, and corroders report a good average movement, particularly of the smaller size packages of Lead in Oil for delivery in the immediate vicinity. Prices have ruled very steady throughout.

Red Lead.—Nothing more than ordinary business has taken place in this article, and prices have ruled very steady.

Linseed Oil.—Prices have ruled very firm for domestic seed Raw Oil, in sympathy with the high cost of raw material. Business has been only fair, however, and the demand is commonplace.

Spirits Turpentine.—There has been rather freer movement of fair sized lots and prices are steadier.

Miscellaneous.—Whiting, Chalk and Clays generally remain steady in price, but are meeting with merely ordinary sale.

TRADE NOTES.

A charter has been granted to the Metal Storage Company of Pittsburgh, Pa., with $2500 capital. The directors are C. I. Travelli, Stewart Johnson, G. W. Irwin, David McCargo and Edward D. Riddle, all of Pittsburgh.

Haight & Clark, Iron and Brass founders, Albany, N. Y., are now making a specialty of Castings in Aluminum and Aluminum Bronze.

The Struthers Iron & Steel Company, Struthers, Ohio, manufacturers of Iron and Steel Sheets and Galvanized Sheets, are running their plant to its full capacity, and are crowded with orders. The new galvanizing department put into operation by this concern some time since is running very satisfactorily.

The crisis in the Manchester cotton industry, which was threatened through the Operatives' Union instructing their delegates not to consent to a reduction in wages called for by the manufacturers, is believed to have been averted, an offer of arbitration having been accepted by both sides. The threatened strike, which would have involved about 160,000 cotton operatives in the British center of that trade, would, if carried out, have given a most serious blow to this important industry.

The November letter of the Anthracite Coal Operators' Association characterizes the anthracite market as extremely unsatisfactory both as regards demand and prices. While a large tonnage was mined during October a considerable portion of it was stocked to await a market, and sales for actual consumption have not been nearly as large as were expected, dealers purchasing only according to immediate requirements. Any improvement which may be expected must come from a prolonged spell of cold weather, which would force buying for consumption. Prices of anthracite are stationary, with the tendency downward, the average sales at the present time being at a little below June figures. Whether or not there will be an improvement before January 1 will depend upon the tonnage put out and purchased in November and December. But it will need the most radical reduction in shipments to effect it.

Late European exchanges gave some account of the large steel works, which are now in course of erection near the town of Saratov on the Volga in Southeastern Russia. These are being built by a concern known as the Volga Steel Works Company. The works cover 92 acres of ground adjacent to the river, and are so arranged that the raw material will be delivered by rail at the highest part and gradually descend in the process of manufacture until the finished products are stored at the warehouses on the river side. A wire making plant will be among the departments provided for. A large model village is being built for the workmen, each family being assigned a separate dwelling

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Metal and Miscellaneous Prices

CHICAGO, NOVEMBER 11, 1897.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
X, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
X, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
X, 14 x 56	21.00	$12.50
XX, 14 x 56	24.00	14.00
X, 14 x 60	23.00	13.50
XX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	1C, 10 x 14; 1C, 12 x 12; 1C, 14 x 20	4.75
	1X, 10 x 14; 1X, 12 x 12; 1X, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
STP / L Grade, 10 to 12 lbs. coating	8.00@ 9 00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.90¢	2.50¢
17 to 20	2 00¢	2.60¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ℔ lb, A... $10.20 } 10%
Patent Planished, ℔ lb, B.... 9.20 } dis.
Craig's Polished Sheet Steel.....8¼¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake..... 11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¾c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch ..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots ..... ℔ lb, 40¢
100-lb lots..... ℔ lb, 36¢
No 2 (guaranteed over 90% pure).
Small lots..... ℔ lb, 34¢
100-lb lots ..... ℔ lb, 33¢
Nickel Aluminum Casting Metal.
Small lots..... ℔ lb, 39¢
100-lb lots..... ℔ lb, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots..... ℔ lb, 35¢
100-lb lots ..... ℔ lb, 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter..... ℔ lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter ..... ℔ lb, 55¢
Aluminum Plates and Sheets, B. & S. gauge.
In lots of 50 lb or more. Less quantities, 5¢ ℔ lb additional.

Wider than	6-in.	14-in.	24-in.
And including.....	14-in.	16-in.	30-in.
	℔ lb	℔ lb	℔ lb
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23.....	.42	.42	.47
" 24.....	.42	.44	.49
" 25.....	.43	.45	.50
" 26.....	.43	.46	.55
" 27.....	.44	.48	.58
" 28.....	.44	.50	.60
" 29.....	.45	.52	.65
" 30.....	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks..... 5¾¢
300-lb casks..... ..5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55..... .....10½¢
Extra Wiping..... .....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson..... .....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4¼¢
Bar.. .....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead GalvanizedLapJoint80&25%
Double Bead GalvanizedSlipJoint80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin..... .....70%
Spiral..... .....50&10%
Plain Tin..... .....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 sq
Climax..... 2.20 sq
The Lloyd Spanish Tiling... 4.50 sq
W. J. Burton & Co.'s Roll Cap 3.00 sq
Subject to discount.

Metallic Shingles—

Cushman's.....dis.

Merchant & Co.'s Gothic Shingles.

	10 x 14	14
IC Tin.... ℔ square,	$4.75	$4
Galv..... ℔ square,	6.25	5

Merchant & Co.'s Spanish Tiles—
Copper, 12 oz., 14 x 20, $25.50 sq
Tin IC, 14x20, $8.00 @ $14.25 sq
Steel, painted, 14 x 20...$7.50 sq
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel
$4.00 square; IC Tin, $4.25; Octago
Fluted Steel, $4.50; IC Tin, $5.00
Gothic Tile, Tin, $9.00; subject t
discount.

Berger's Spanish Tiles—
Copper, 12 oz., 14 x 20..$25.50 sq
IC Tin, 14 x 20 ..... 8.00 sq
Steel Painted, 14 x 20 .. , 7.50 sq

Cortright's Metal Slates—
14 x 20.....$5.25 sq
10 x 14..... 5.50 sq
7 x 10..... 6.50 sq

Cortright's Victoria Shingles—
10 x 14.....$6.75 sq
7 x 10..... 8 50 sq
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....

Paints, Oils, &c.

Deodorized Benzine.....8 @
Iron Paint, Bright Red.....℔ lb
" " Brown.....℔ lb
" " Purple .....℔ lb
" " Ground in oil, B. Red, ℔ lb
" " Ground in oil, Red...℔ lb
" " Ground in oil, Brown, ℔ lb
" " Ground in oil, Purple, ℔ lb
Linseed Oil, Boiled, in bbls.....
Linseed Oil, Raw, in bbls.....
Mineral Paints.....1 @
Orange Mineral.....
Pure White Lead in Oil.....5½ @
Dry White Lead in bbls.....5 @
Red Lead, American.....5¼ @
Red, Venetian, English, dry..1½ @
Red, Venetian, in oil, asst'd cans.....
kegs. 3 to
Sipe's Japan Oil, in bbls., ℔ gal.....
Spirits Turpentine, in bbls., ℔ gal..34
Asphaltum, Trinidad Refined, ℔ ton.
Tarred Felt, 1 Ply, ℔ 100 lb.....$
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$
Roofing Pitch, ℔ bbl. of 300 lb.....$3

NEW YORK, NOVEMBER 12.

The following quotations are for small lots:

luminum—

1 Aluminum (guaranteed over 99% ire), in ingots for remelting.
ll lots.....₱ ℔, 40¢
℔ lots.....₱ ℔, 36¢
minum Rods, from ¾-in diam.
I in. diam.....₱ ℔, 53¢
mlaum Sheet, B. & S. gauge.
In lots of 50 ℔s or more.

	6-in.	14-in.	24-in.
er than	14-in	24-in.	30-in.
t including.....	₱ ℔	₱ ℔.	₱ ℔.
13 to 19.....	$0.38	$0.40	$0.43
20.....	.40	.42	.45
21 to 23	.42	.44	.47
24.....	.42	.46	.49
25.....	.43	.47	.50
26.....	.43	.50	.55
27.....	.44	.53	.58
28.....	.44	.53	.60
29.....	.45	.54	.65
30.....	.46	.60	.73

ote.—Lots of less than 50 ℔s 5¢ ₱ ℔ ra.

Antimony—

)rson.....₱ ℔, 8½@8¾¢
llett's .....₱ ℔, 7¾@8¢
)anese .....₱ ℔, 7½¢

Brass—Planished.....net

)ll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

own & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

dia Round Tube.	Per ℔.
¼-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
5-16-in. up to ½-in.	1.00
⅝-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
⅛-in. and larger	Special
⅛-in. to 3-in., to No. 19, inclusive.	.38

35% off.

opper & Bronze Tubing—

3¢ ₱ ℔ more than Brass.

Conductors—

orrugated. *Round or Square.*—

ilvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
n.....70%

Spiral Riveted.

ilvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

ottoms, Pits and Flats₱ ℔ 18½@19¢ basis
Ingot.
ake.....12¼¢
nsoala Grade Casting.....11¼¢
anished.....net
rod and Bolt.....15¢ ₱ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
ap or Slip Joint, Galvanized....80&10%
ap or Slip Joint, Terne.....65%

Eave Trough Mitres—

ap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

in.....70&10%
alvanized.....80%

Crimped Tubing.

etinned or Galvanized.....35%

Stove Pipe—

uffalo Four-Piece.

	4¼	5	5½	6	7-inch.
o. 1.	$0.70	.77	.82	.87	1.05 per doz.
o. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
in.....35%
alvanized.....35%

Corrugated. *Flat Crimp.*

alvanized.....70&5%
Round or Square.
in.....70&5%
alvaalzed.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
os. 10 to 16.....	₱ ℔, 2 00....	2.30¢
os. 17 to 21.....	₱ ℔, 2.10....	2.40¢
os. 22 to 24.....	₱ ℔, 2.20....	2.50¢
os. 25 and 26...	₱ ℔, 2 30....	2.60¢
o. 27	₱ ℔, 2.40....	2 80¢
o. 28	₱ ℔, 2.50....	2 80¢

merican B. B.....₱ ℔, 4¢
Russia, Planished, &c.
enuine Russia, according to assortment.....₱ ℔, 10¼@10½¢
o. Stained.....6¢@10¢
atent Planished ₱ ℔. A, 9¾¢; B, 8¾¢ net
raig Polished Sheet Steel.....₱ ℔, 8½¢

Galvanized.

Nos. 10 to 16.....	₱ ℔, 12¢	75&10& 5% off.
Nos. 17 to 21.....	₱ ℔, 13¢	
Nos. 22 to 24.....	₱ ℔, 14¢	
Nos. 25 to 26.....	₱ ℔, 15¢	
No. 27.....	₱ ℔, 16¢	
No. 28.....	₱ ℔, 17¢	
No. 29.....	₱ ℔, 19¢	
No. 30.....	₱ ℔, 21¢	

36 in. 1¢ ₱ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig .....4⅛@4¾¢
Bar.....5¢
Pipe.....6¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet .....7¢. 20%
Old Lead in exchange, 3¼¢ ₱ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔.....5¾@6¢
Lead. Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1½¢
Red Venetian, American..... @1¾¢
Linseed Oil:
Raw, ₱ gal..... @39¢
Boiled..... @41¢
Spirits Turpentine:
In bbls.....33¢
In cases.....41¢
Putty:
In barrels and ½ bbls..... 1¾@2¢
In tubs.....1¾@2¢
In tin cans..... 2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₱ ℔ 5 ¢
Clarified.....₱ ℔ 4¾¢
Accra.....₱ ℔ 4¾¢
Half Jack.....₱ ℔ 4½¢
Cecilia.....₱ 100 ℔ $4.85
Choice Red.....₱ 100 ℔ 4.60
(*Spot Oil, ½c. ₱ ℔ higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline..... ₱ gal. 10@11¢
Kerosene.....₱ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized 60%
Tin 60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Busbings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves..65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnau's..65%
" " " " Finished..65%
Compression Work.....65%
Cbain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs 65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₱ doz.....net

Bath Tubs—

Copper Lined Batb Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&5%
Porcelain Lined Iron Batb Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Batb Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Rauge Boilers above 52 gallon.....70%
Galvanizen Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air cbambers, Plain.....50%
Cast Iron Sinks, Backs witb air cbambers Galvanized 50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....55%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated.....40&10%
Solid Bronze.....25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%
1896 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₱ ton.....$30.00@$35.00
Asphaltum, Rock. ₱ ton.....$14.00
Coal Tar Felt, 1 ply, ₱ ℔.....2¢
2 Ply Rooflug, ₱ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₱ roll, 108 sq. ft.....1.35
Roofing Pitch, ₱ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₱ bbl.	$1.82@$1.83
Rosin, E. & F.....	₱ bbl.	1.84@ 1.87
Rosin, G. & H.....	₱ bbl.	1.90@ 1.95
Rosin, I. & K	₱ bbl.	2.00@ 2.05
Rosin, M. & N.....	₱ bbl.	2.10@ 2.25

Seamless Brass Tubes—

Net List, Feb. 1. 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₱ sqr.	$3.75@$5.00
No. 1 Bangor Ribbon.....	3.35@ 3.75
Pen Argyle, ₱ sqr.....	3.75@ 4.35
Peach Bottom, ₱ sqr.....	4.75@ 5.60
No. 1 Chapman, ₱ sqr....	3.80@ 4.80
Lehigh Slates, ₱ sqr	3.00@ 4.50

Vermont:

Sea Green, ₱ sqr.....	$2.50@$3.55
Purple, ₱ sqr.....	3.25@ 4.00
Unfading Green, ₱ sqr...	3.75@ 4.50
Red, ₱ sqr.....	9.00@11.00

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10¾@11¢
No. 1..... 9¾@10¼¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels, ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔. ₱ ℔.....3½¢
½ bbls., about 300 ℔. ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg
Kegs about 55 ℔, ₱ ℔.....4¢
5% dis.

Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, ₱ ℔.....40¢

Soldering Coppers—

Per ℔.....15½¢@17½¢ net

Spelter—

Western Spelter.....4.65@4¾¢
Bertba (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized 60%

Tin Pigs and Bars—

Banca, Pigs, ₱ ℔.....15¼¢
Straits, pigs, ℔ ℔..... 14¾¢
Straits, in bars, ₱ ℔.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Callaud or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20....	6.75
" "	IXXX,	14 x 20....	7.75
" "	IXXXX,	14 x 20....	8.75
" "	DC,	12½ x 17....	4.25
" "	DX,	12½ x 17....	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20...	5.75
" "	IXXX,	14 x 20...	6.50
" "	IXXXX,	14 x 20...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔	10¢
95 ℔	15
90 ℔	20¢
85 ℔	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating.....	8.00 @ 9.25
STP / L Grade, 10 to 12 ℔ coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₱ ℔.

Charcoal Plates, Bright—

Melyn and Cal-land Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.95
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke,	IC,	14 x 20 ..... $4.25
	IX,	14 x 20..... 5.25

Terne Plates—

MF, IC, 14 x 20.....	$6.30
20 x 28.....	12.60
Worcester Grade, IC, 14 x 20.....	4.25
20 x 28.....	8.50
Dean Grade, IC, 14 x 20.....	4.00
20 x 28.....	8.00
Gilbertson's Old Method, IC, 14 x 20..	7.50
20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₱ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain	72%
1¼ and less, Galv.....	67%
1½ and larger, Plain.....	78%
1½ and larger, Galv.....	70%
Screw and Socket Joint Casing.....	65%
Inserted Joint Casing.....	60%
Boiler Tubes, 2¼ inch and smaller.	72½%
" 2½ inch and larger	75%

Zinc—

600 ℔ casks ₱ ℔ 5¾¢ | Per ℔.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son, Utica, N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.

Architectural Ornaments.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Weitzel, J. F., Cincinnati, Ohio.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Ash Sifters.
Cleveland Stamping & Tool Co., Cleveland, Ohio.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Copper.
Randolph & Clowes, Waterbury, Conn.

Boilers, Range.
Wolff, L. Mfg. Co., Chicago, Ill.

Books.
Tower, F. W., Springfield, Mass.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.
Weitzel, J. F., Cincinnati, Ohio.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. *(See Pipe Couplers.)*

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Selner & Co., Indianapolis, Ind.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co, Erie, Pa.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Ct.
Stiles & Fladd Press Co., Watertown, N. Y.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Box Partitions.
Gilbert, Carleton M., P. O. Box 2490, New York.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Excelsior Steel Furnace Co., Chicago, Ill.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Beckwith, P. D., Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Brand Stove Co., Milwaukee, Wis.
Buckwalter Stove Co., Royersford, Pa.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Excelsior Steel Furnace Co., Chicago, Ill.
Floyd, Wells & Co., Royersford, Pa.
Fox, F. B., Cleveland, O.
Fox Furnace Co., Cleveland, O.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Mt. Penn Stove Works, Reading, Pa.
Pease, J. F., Fuel Co., Syracuse, N. Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass
Schwab & Sercomb, Milwaukee, Wis.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Stamford Foundry Co., Stamford, Ct.
Superior Fdry. Co., Little Falls, N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Turner Heater Co., Bristol, Ct.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Hull, M. L., Cleveland, O.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Galvanizing.
Gregory, Thos. Galvanizing Works, Brooklyn, N. Y.

Gas Heaters. *(See Stoves and Ranges, Gas.)*

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Watrous & Co., Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Empire Heating Co., Easton, Pa.
Excelsior Steel Furnace Co, Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Johnson & Co., 84 John St., N. Y.
Mitchell Heater Co., Poughkeepsie, N. Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fuel Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
Kleckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Illinois Pure Aluminum Co., Lemont, Ill.

House Furnishing Supplies.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co., Boston, Mass.

Iron, Galvanized Sheet. *(See Sheets, Galvanized.)*

Iron, Kalamelned.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. *(See Sheets, Iron and Steel.)*

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lard Cans.
Kleckhefer Bros. Co., Milwaukee, Wis.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. *(See Ceilings, Metallic.)*

Mica.
Huse, Jos. & Son, Boston, Mass.
Munsell, Eugene & Co., 218 Water St., New York.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & VanWinkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Oil Heaters. *(See Stoves and Ranges, Oil, Vapor and Gasoline.)*

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Peck Bros. & Co., New Haven, Conn.
Randolph & Clowes, Waterbury, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson, R. M., Rome, N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Pokers and Lifters.
Arcade Mfg. Co., Freeport, Ill.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
West Mfg. Co., Buffalo, N. Y.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.

Radiator Rests.
Gorman-English Co., Wilkes Barre, Pa.

Radiators, Hot Air.
Castle, Wilmot & Co., Rochester, N. Y.
Rochester Radiator Co., Rochester, N. Y.
Waste Heat Radiator Co., Buffalo, N. Y.

Radiators, Steam and Hot Water.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
Wheeler, E. S. & Co., New Haven, Ct.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Registers.
Berger Bros., Phila., Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Highton, Wm. & Sons, Boston, Mass.
Kernan Furnace Co., Utica, N. Y.
Schreiber & Conehar Mfg. Co., Dubuque, Iowa.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Roasters and Bakers.
Hill-Whitney Aluminum Co., Boston, Mass.

Roofing, Asphalt.
Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Bowers, L. M. & Co., Binghamton, N. Y.
Burtou, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Ct.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 33 Park Row, N. Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.
New York Trade School, First Ave. and 67th St., N. Y.

Scrap Metals.
Detroit melting and Refining Works, Detroit Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., New Haven, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Universal Machine Co., Canton, Ohio.
Watrous & Co., Troy, N. Y.
West Mfg. Co., Buffalo, N. Y.

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Sheet Metal Work.
Weitzel, J. F., Cincinnati, Ohio.

Sheets, Iron and Steel.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia Pa.

Sheets, Galvanized.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.
Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.
Colwell Lead Co., 63 Contre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.
Watrous & Co., Troy, N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties Manufactured.
Burrows, F. S., 107 Beekman St., N. Y.

Stamped Ware, Aluminum.
Illinois Pure Aluminum Co., Lemont, Ill.

Statuary, Sheet Metal.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.
Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Berger Bros., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.
Parks & Parks, Troy, N. Y.

Stove Putty.
Connors, Wm., Troy, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Clark, Henry N. Co., Boston, Mass.
Kieffer Bros., Syracuse, N. Y.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Morris, J. L., Chicago, Ill.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.

Stove Trucks.
Mersick, C. S. & Co., New Haven, Ct.

Stoves and Ranges.
Beckwith, P. D., Estate of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Boynton Furnace Co., 207-209 Water St., N. Y.
Brand Stove Co., Milwaukee, Wis.
Buckwalter Stove Co., Royersford, Pa.
Bussey & McLeod Stove Co., Troy, N. Y.
Champion Steel Range Co., Cleveland, Ohio.
Eclipse Stove Co., Mansfield, O.
Floyd, Wells & Co., Royersford, Pa.
Gem City Stove Co., Dayton, O.
Graff & Co., 208 Water St., N. Y.
Magee Furnace Co., Boston, Mass.
Marion Stove Co., Marion, Ind.
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Sheppard, Isaac A. & Co., Phila., Pa.
Somerset Stove Foundry Co., Somerset, Mass.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., New York.
Warren Hardware Co., Warren, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Bradley, Munk & Co., Columbus, O.
Reineke, Wilsou & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Miller, Edward Co., Meriden, Conn.
Monarch Stove Co., Mansfield, O.
Ringen Stove Co., St. Louis, Mo.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., New York.
Rochester Stamping Wks., Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tea Pots.
Rochester Stamping Works, Rochester, N. Y.
Rome Mfg. Co., Rome, N. Y.

Tinners' Tools, Machines and Supplies.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. O. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tin Plate. (*Mfrs. of.*)
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lishon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Trade Schools.
New York Trade School, First Ave. and 67th St., N. Y.

Tubing, Brass and Copper.
Randolph & Clowes, Waterbury, Conn.

Valves.
Eastwood Wire Mfg. Co., Belleville, N. J.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.
Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.
Marston, I. G. & Co., Boston, Mass.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co., 47 Dey St., N. Y.
Pock Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these colnmns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

In small fonndry near Chicago. few experienced MOLDERS on fine stove work; steady work. "Molders," offiee of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

A first-elass SALESMAN to sell stoves in Pennsylvania; state age, experience and salary expeeted. Address by mail W. S. Price, president G. Stove Company, Royersford, Pa. Nov. 13

One good TIN and GALVANIZED IRON WORKER; married man preferred; man who can get ont and put up a job of cornice, or do a shaving pipe job; steady work to a general workman. Apply to 68 West Main street, Lexington, Ky. Nov. 13

COPPERSMITH.—Man familiar with manufacture of range boilers or similar work. Address, stating references, age, married or single, where last employed, together with experienco; replies confidential if so desired. "Coppersmith," offiee of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

Praetical FURNACEMAN who has had experionee on the road to sell furnaces and boilers in Wisconsin and Minnesota: one who understands steam and hot water heating preferred. "Furnace Man," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Nov. 13

An experienced SALESMAN to travel for a manufactnrer of boilers and furnaces in Illinois and Iowa; mnst understand warm air, steam and hot water heating "Experience," office of *The Metal Worker*. 59 Dearborn street, Chicago, Ill. Nov. 13

A Connectieut house wants a young man familiar with plumbing goods and prices as ASSISTANT BOOKKEEPER and to aid in selling and estimating; state experience, age and reference. "Klondike," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

A FOREMAN to take charge of a metal cornice, skylight and jobbing shop; ono who thoroughly nnderstands the business and can estimate on work from architects' plans. "Foreman," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Nov. 6

A first-elass SALESMAN for New York City and vicinity trade for season of 1898, by a Western house located in that market: must have large aequaintance with trade in that section. "First Class," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

Experienced SALESMAN in Western New York for 1898 by a large stove and furnace manufacturer who manufactnres a full line of goods appropriate for this market; must have experience and a calling among the trade of this section. "Experience," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

At once. a good all around TINNER and SHEET METAL WORKER for inside and outside work; must be sober and reliable. C. T. Childers, Galesburg, Ill. Nov. 6

A man who understands FURNACE and CORNICE WORK; must be able to cnt and detail work; steady work year around; unless first-class do not apply; state wages wanted. King Bros., Danville, Ill. Nov. 6

To correspond with SALESMAN visiting stove and hardware trade in Boston, Mass., and adjacent territory, who can handle a first-class lne of oil lamp stoves and gas hot plates. Address, giving particnlars, "Stoves," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

Fred. C. Andrews, tinner, can learn of a good joh by addressing "J. C. D.," 35 Washington street, Buffalo, N. Y. Nov. 6

PLUMBER and TINNER at once; one who can wipe a joint; must be sober and steady. Address, with price, Geo. W. Gibney, Pawting, N. Y. Nov. 6

A good, honest boy. 16 or 17 years of age, to learn the tinsmith and plnmbing trades; must sorve three years; a boy who smokes cigarettes or is profane need not apply; the terms are, with board and washing, $30 first year, $40 second year, and $50 last year. A. W. Kreidel, Lititz, Pa. Nov. 6

Several first-class STOVE SALESMEN for Western territory, competent to handle complete lines of stoves, furnaces and gas stoves. Address, by mail, stating experience, past sales, territory covered, age, and salary expected, Detroit Stove Wol ks, Chicago, Ill. Nov. 6

A BRASS MOLDER capable of turning out absolntely smooth, perfect castings; none other need apply: state references and wages. "Castings," office ef *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Nov. 6

A good STEAM and HOT WATER FITTER with some knowledge of plumbing in a Connecticut town; a good place for the right man. "Nutmeg," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

A TINNER who can drive slate; one who can do plumbing or steam heating preferred. W. A. Gephart, St. Clairsville, Ohio. Oct. 30

A good TINSMITH aud JOBBER to come and locato in a live New England town. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

SITUATIONS WANTED.

As PATTERN CUTTER in job, ventilating or blow pipe shop by a man ol extended experience; cuts by triangulation. "A. E. H.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

Steady employment by a strictly first-class PLUMBER; also understands steam and hot water heating. "W. D. C.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

By first-class FURNACEMAN and GENERAL TINSMITH; 20 years' experience; strictly sober man. "Furnaceman," 128 Hamilton street, Cleveland, Ohio. Nov. 13

By TIN and SHEET IRON WORKER; eight years' experience; city or country; can do roofing, heater, range, leader and gutter work and general jobbing; not afraid of work, and strictly sober. Harry Wolfson, 73 East 106th street, New York City. Nov. 13

After January 1 to represent west of Chicago a hardware. tinware, stove or furnace house; well posted in all the lines. "Well Posted," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

An experienced FOREMAN, good draftsman and accurate and rapid estimator will be at liberty January 1, 1898, and desires to correspond with cornice and skylight concerns in need of such a man; if necessary, could leave present place sooner; satisfactory reasons for changing. "Push," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

By a SOLDERER with over 15 years' experience; can also work at steam fitting, run drill press, &c.: would work for $7 a week for a steady job; has reference. "J. M. T.," care M. E. Ross, 301 Sixth street, Brooklyn, N. Y. Nov. 13

By a TINNER; young man with 14 years' experience at general job work, roofing and guttering; would like to make contract first of the year; strictly sober and reliable; reference; will work reasonable. Box 207, Harrodsburg, Ky. Nov. 13

By first-elass PLUMBER; can work from plans and specifications; 15 years' experience; city or country. "Cruet," 74 Washington street, Flushing, N. Y. Nov. 13

For 1898, by man with established trade in Ohio in tin plates, metals and tinners' stock; also acquainted with the stove and house furnishing goods trade. "F.," care 135 South Front street, Columbus, Ohio. Nov. 13

An experienced stove, furnace and gasoline stove SALESMAN, with established trade in Indiana, Michigan and Ohio, would like to correspond with some good concern relative to the season of '98. "Buckeye," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

At PLUMBER, STEAM and HOT WATER FITTER wants a steady position; ean furnish three years' reference from last employer. "Harsin," 951 Sixth avenue, New York City. Nov. 13

By thorough experienced TRAVELING SALESMAN, BOOKKEEPER or MANAGER: has had 20 years' foundry experience in all departments; West or Northwest territory preferred. "American," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

TINSMITH. — A thoroughly practical all around tinsmith: extensive experience in hot air, hot water and steam heating; a master of sheet metal work; strictly sober and industrious; will make very reasonable arrangements for a permanent arrangement. "Frank," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

By two SLATE ROOFERS: 12 years' experience. "Slater," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

Permaneut position with a reliable firm as eollector; young man acquainted with New England: experienced: salary or commission. "Collector," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

TRAVELING SALESMAN of experienco wonld be pleased to correspond with Eastern manufactnrers with a view to representing them on tho Pacific Coast; satisfactory references furnished. "Manufactnrers' Agent," 429 Kearney street, San Franciseo, Cal. Nov. 6

By TINSMITH and SHEET IRON WORKER; 22 years' experience at the bench; 15 years in last position; can draw own patterns and has had charge of shop; New England State preferred. "P. D. Q.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

By a PLUMBER, STEAM and HOT WATER FITTER: thoronghly competent; can estimate work from plans and specifications; small or largo jobs; city or eonntry jobbing; experienced at soil pipe calking and testing: 20 years' experience: roference. "F. C., No 116," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

As TINSMITH and JOBBER: eight years' experience. H. Roth, 206 East Fonrth street, New York City. Nov. 6

As SUPERINTENDENT or FOREMAN of a stove fonndry: capable of taking charge of whole or any part of plant; willing to work for a roasonable salary: best of reference. "A1," office of *The Metal Worker*, 232-238 William street, Now York City. Nov. 6

By a young man as TIN and SHEET IRON WORKER and JOBBER; understands tin roofing, eave troughing, pump and pipe work, kitchen boiler eonnections, &c.: strictly sober and steady; wages moderate for steady position; referenees. "Tinsmith," care A. Oliver & Co., 173 East Ferry street, Buffalo, N. Y. Nov. 6

SALESMAN of experience, acquainted with department stores, house furnishing, hardware and tin trado in Philadelphia, would like the account of a first-class honse for city or road. "M.," 404 Lippincott Building, Philadelphia, Pa. Nov. 6

BOOKKEEPER.—Practical double entry bookkeeper and cashier of many years' experience, possessing energy and business abilities, is open for engagement with wholesale house or manufactuing concern; A1 penman and correspondent; best of reterences as to character, &c. 312 Walnut street, Williamsport, Pa. Nov. 6

Steady situation by a steady, sober TINSMITH; tin roofing, guttering, aud eaves troughing; inside work; iron pipe and pump work; kitchen boiler connections; references first-class; town of 5000 to 30,000 preferred, where water works are installed. "Tinsmith," 122 Highland avenne, Buffalo, N. Y. Nov. 6

BOILER SALESMAN of ability and experience open for engagement December 1; thoroughly experienced in all manner of steam and water warming; well known to tho trade in Pennsylvania and Maryland, and can furnish highest references: no objections to going elsewhere. S. C. W.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 6

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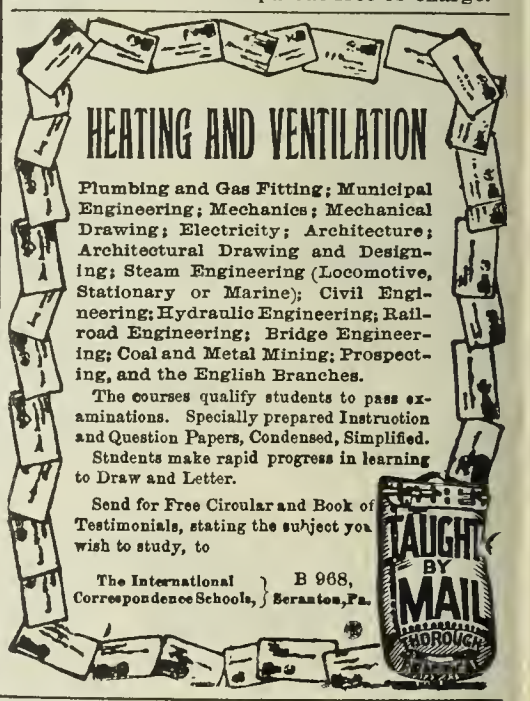
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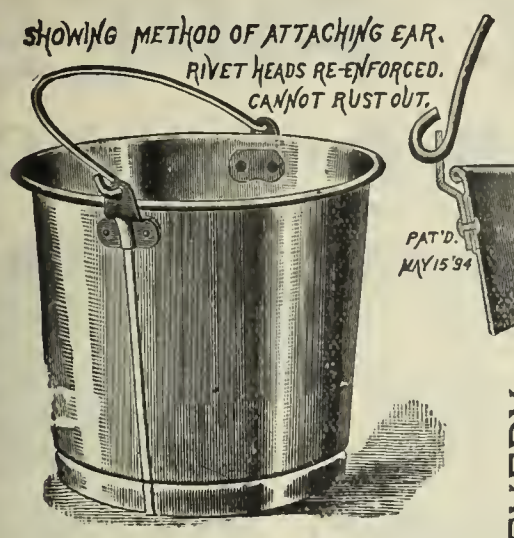

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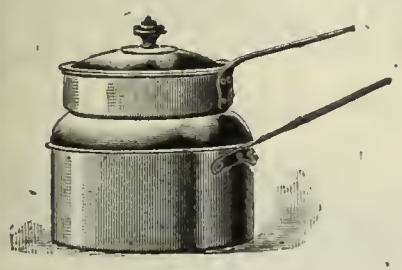

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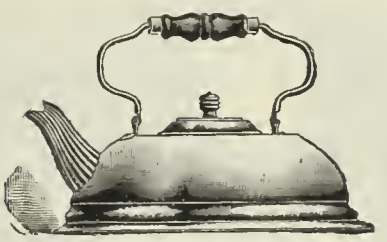

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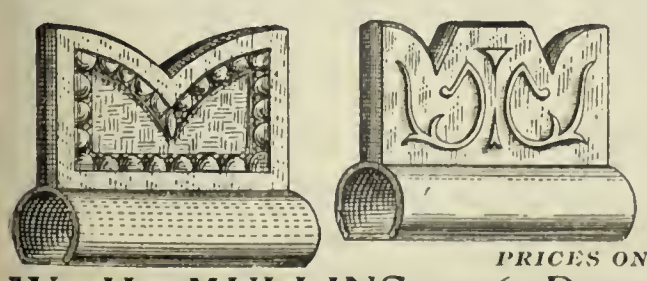

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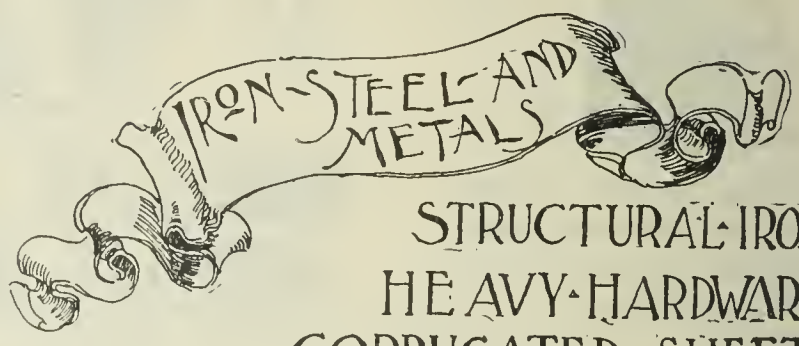

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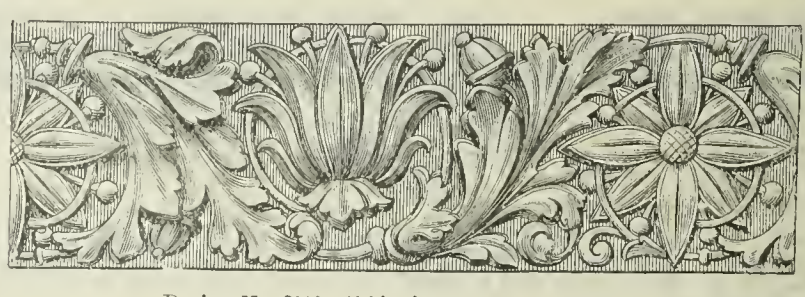

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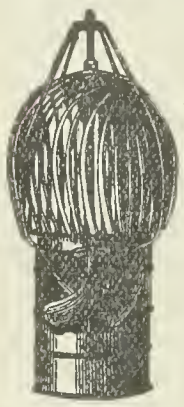

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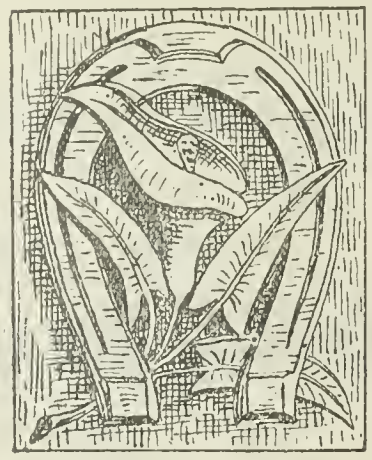

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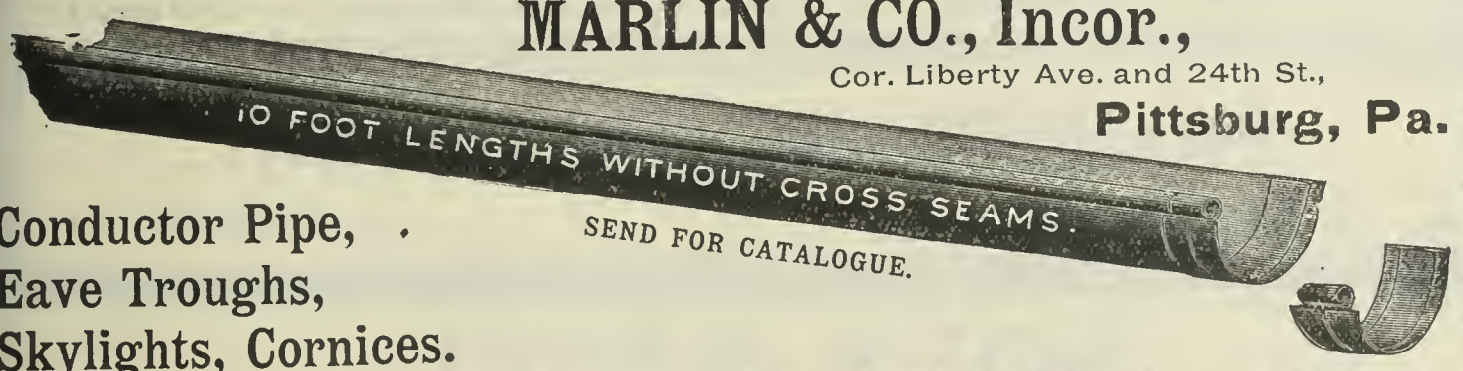

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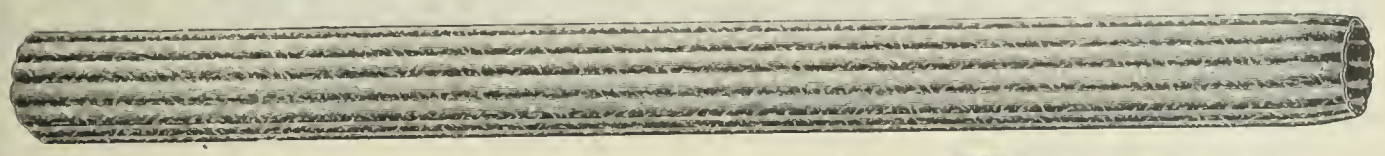

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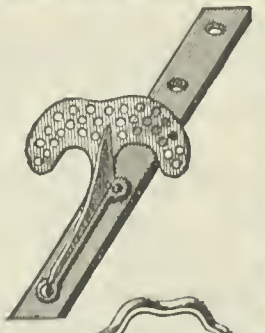

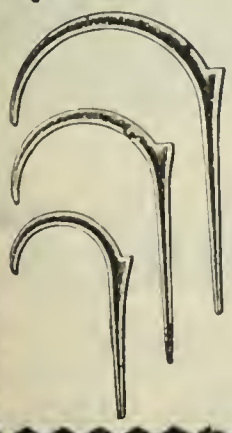

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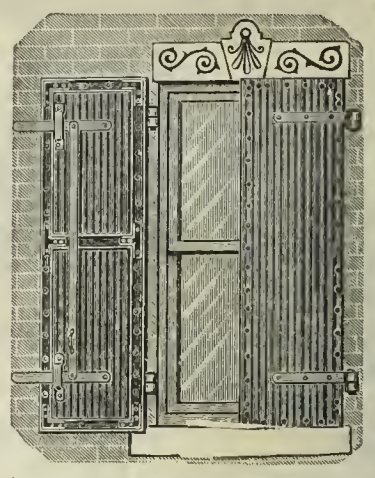

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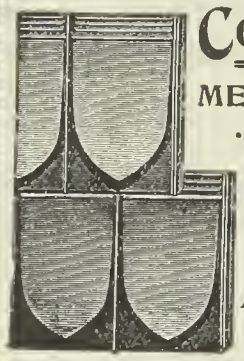

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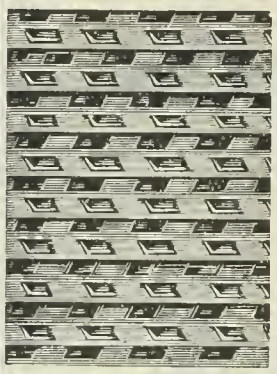

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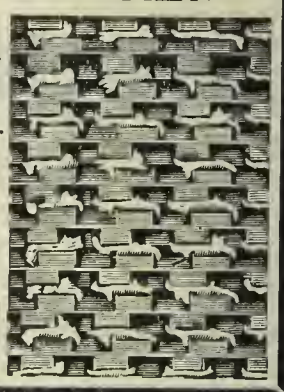

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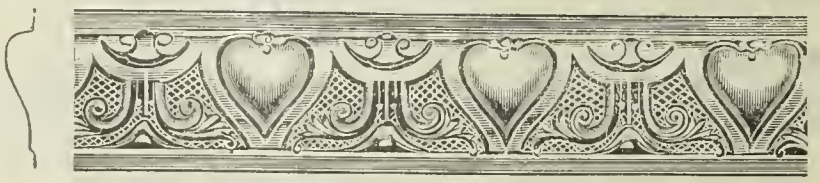

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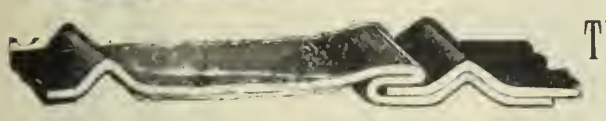

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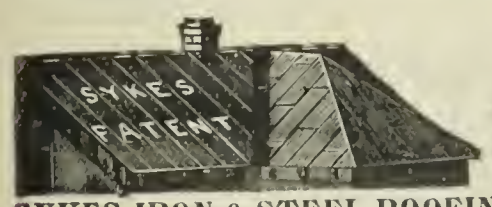

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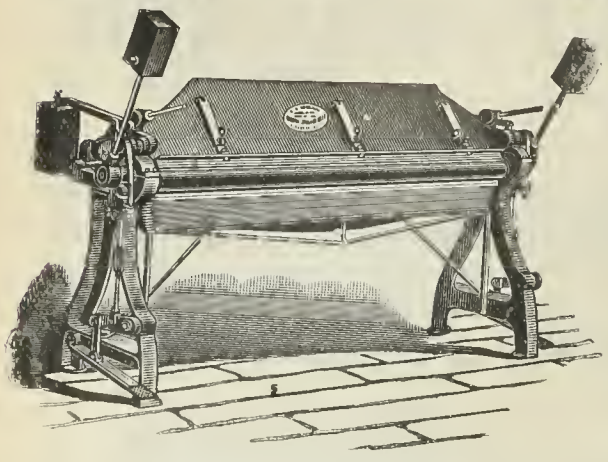

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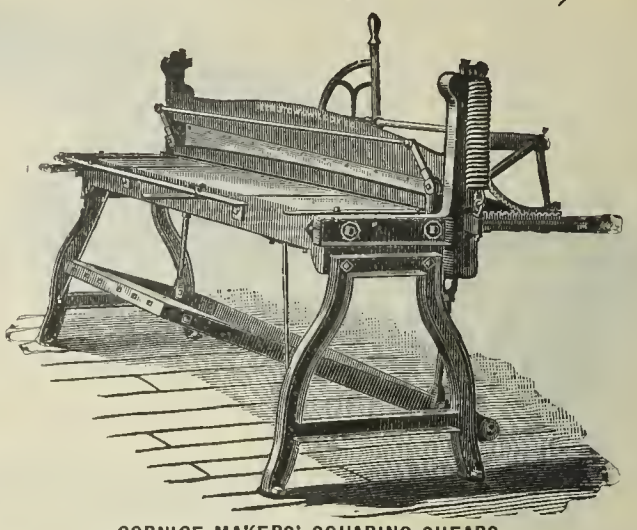

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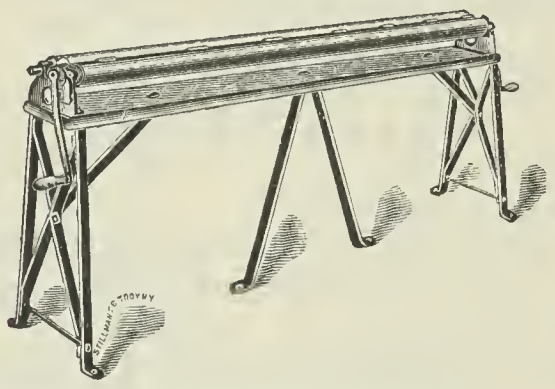

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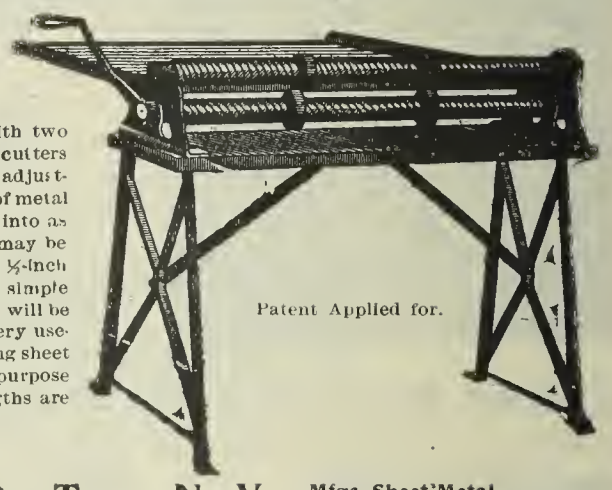

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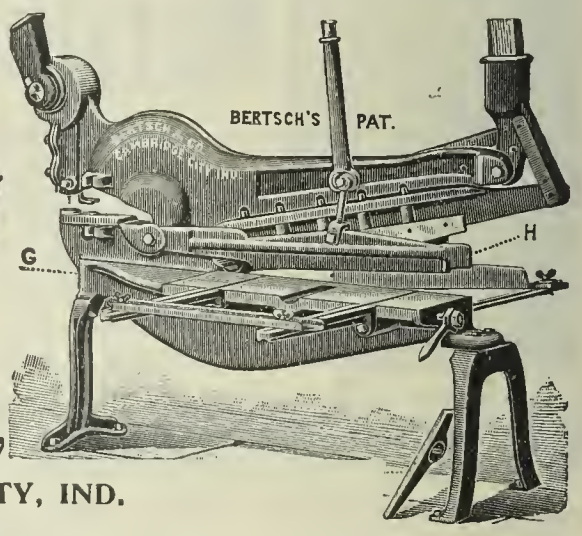

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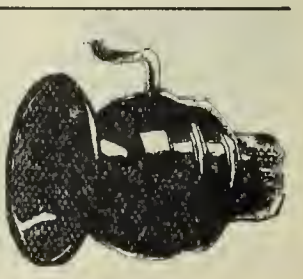

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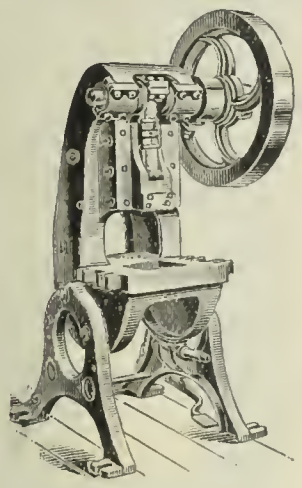

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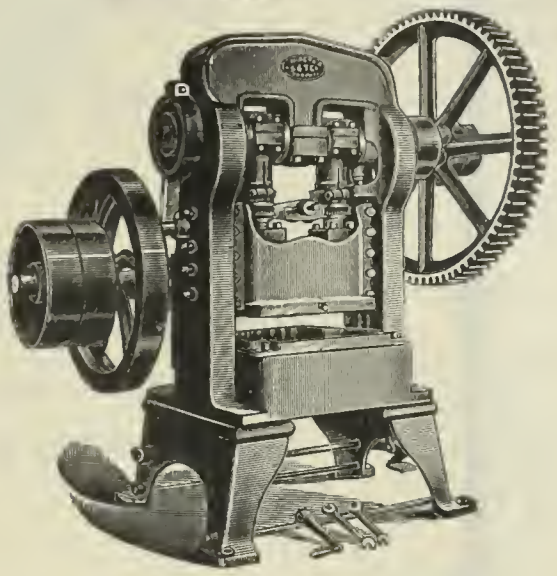

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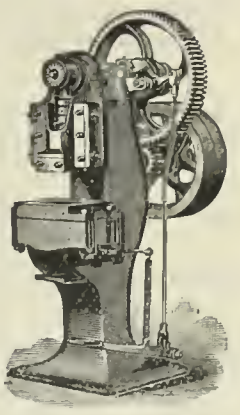

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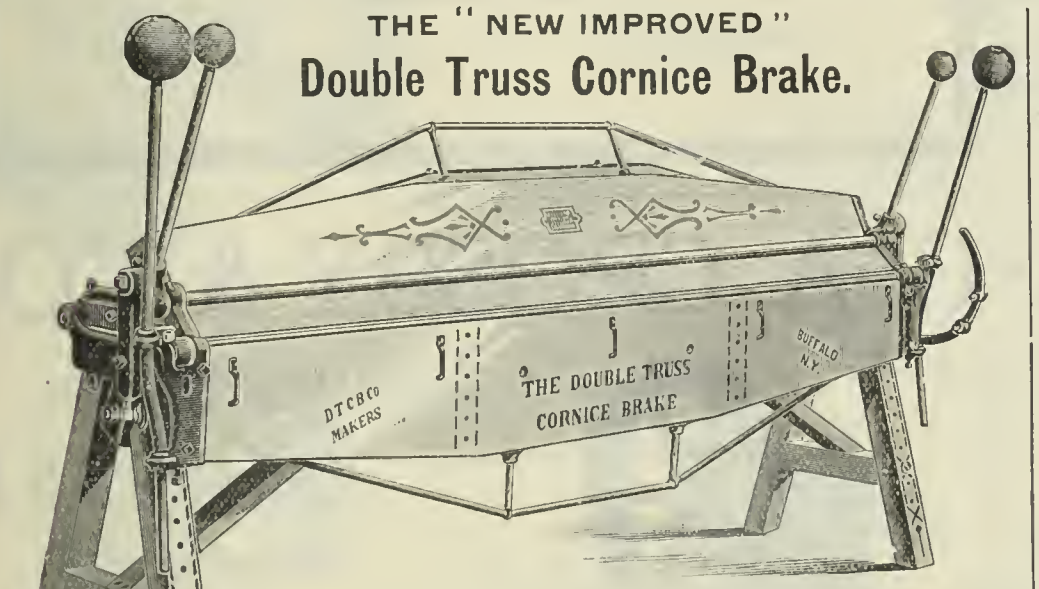

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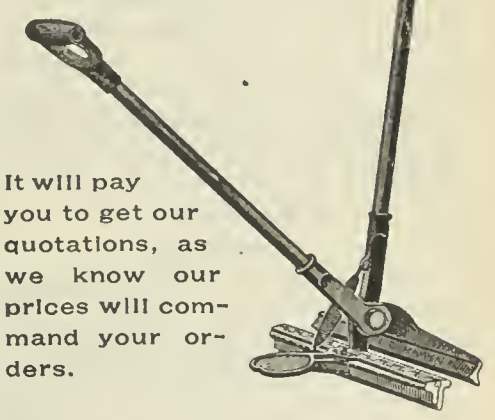

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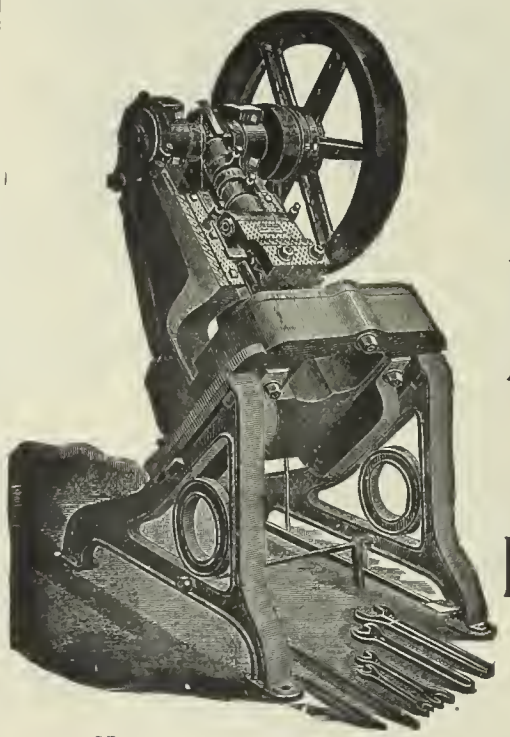

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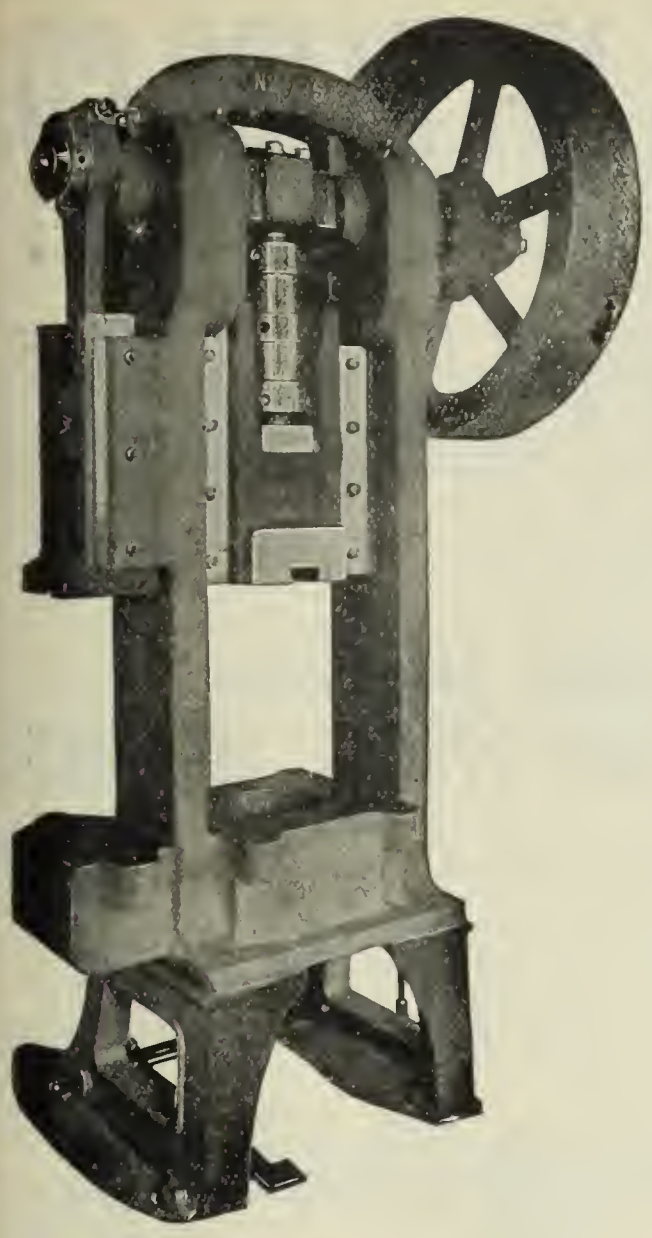

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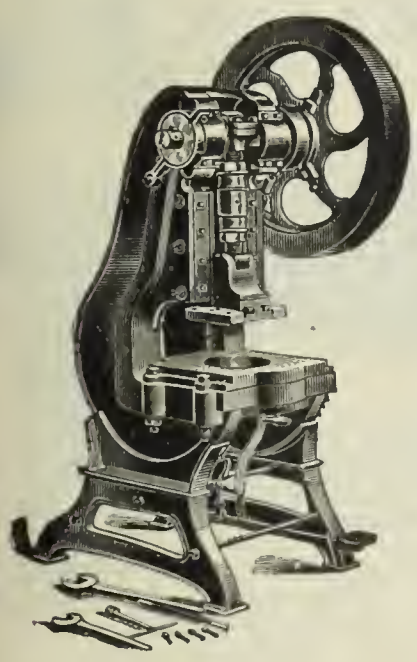

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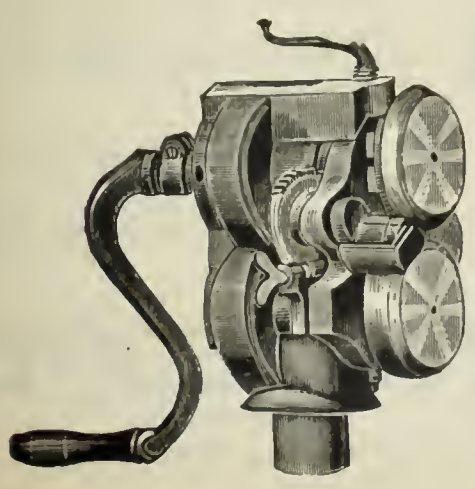

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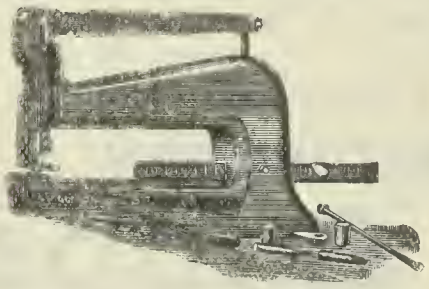

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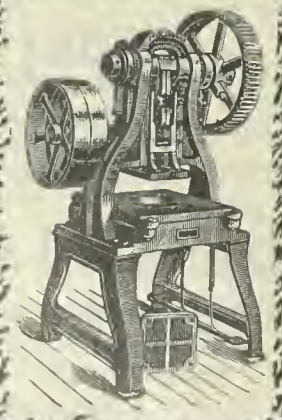

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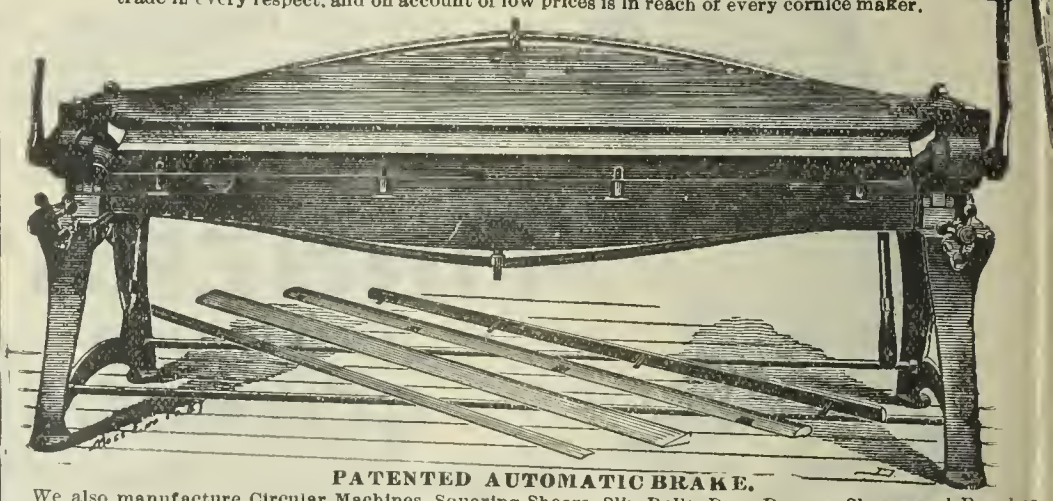

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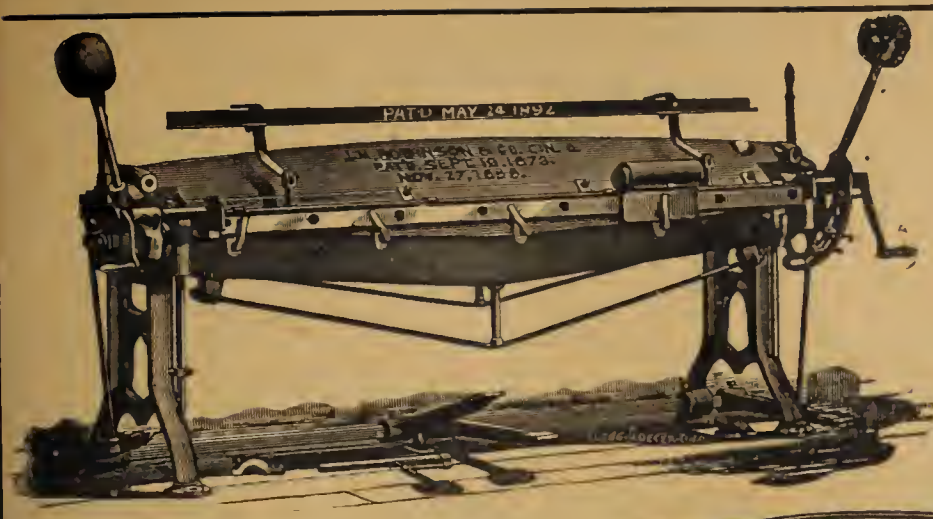

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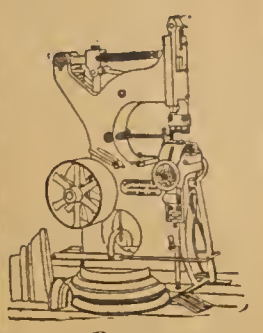

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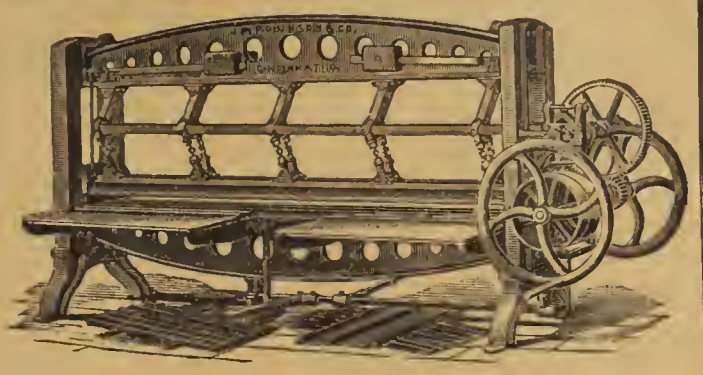

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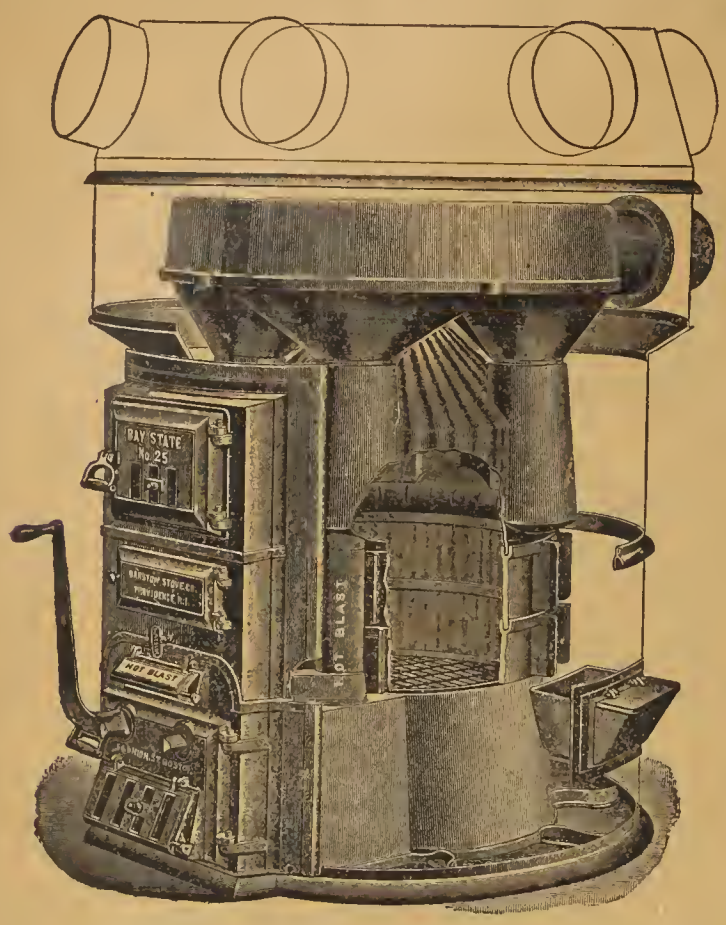

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Index to Reading Matter, Page 60 Index to Advertisements, Pages 63 - 65

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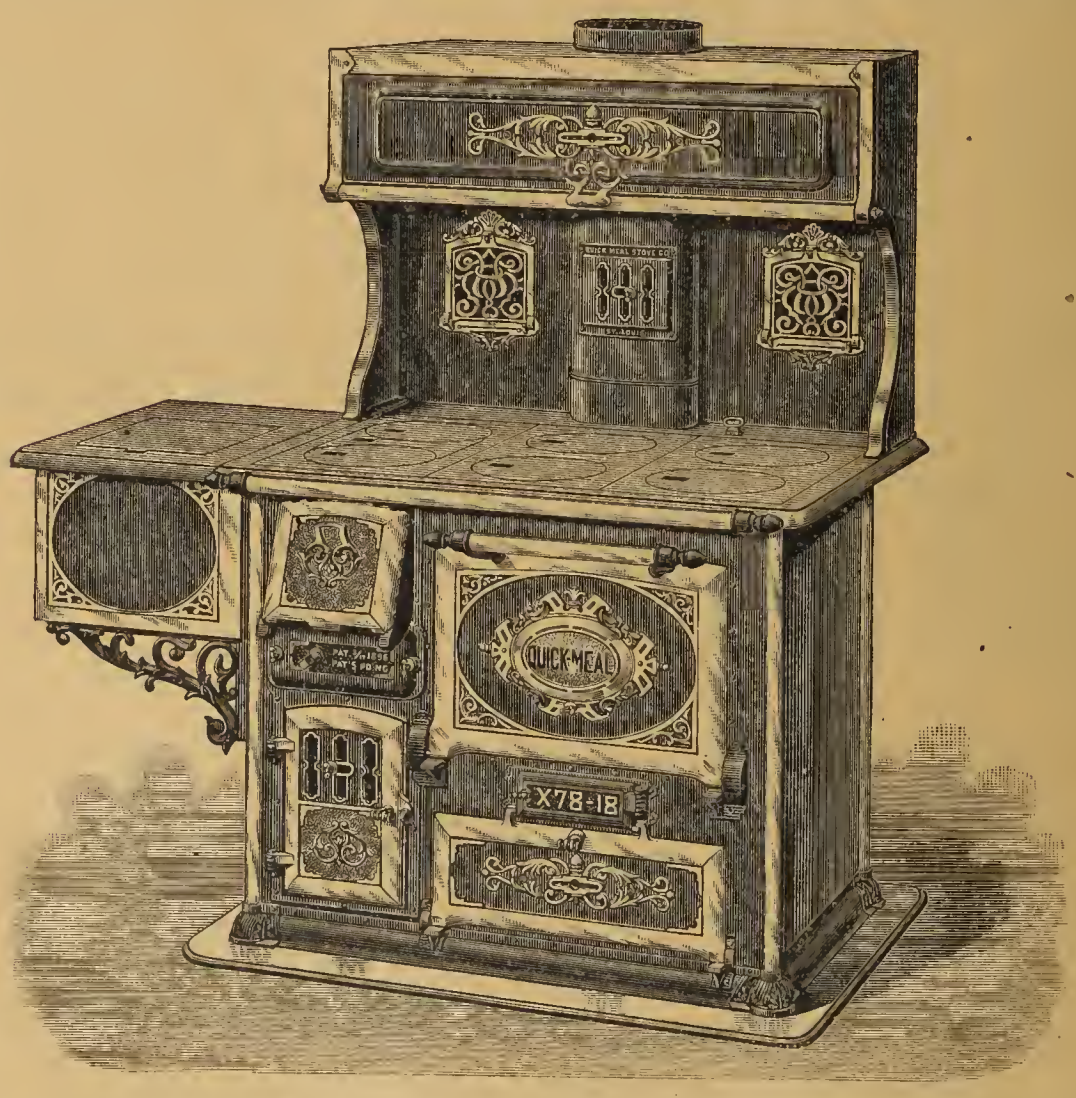

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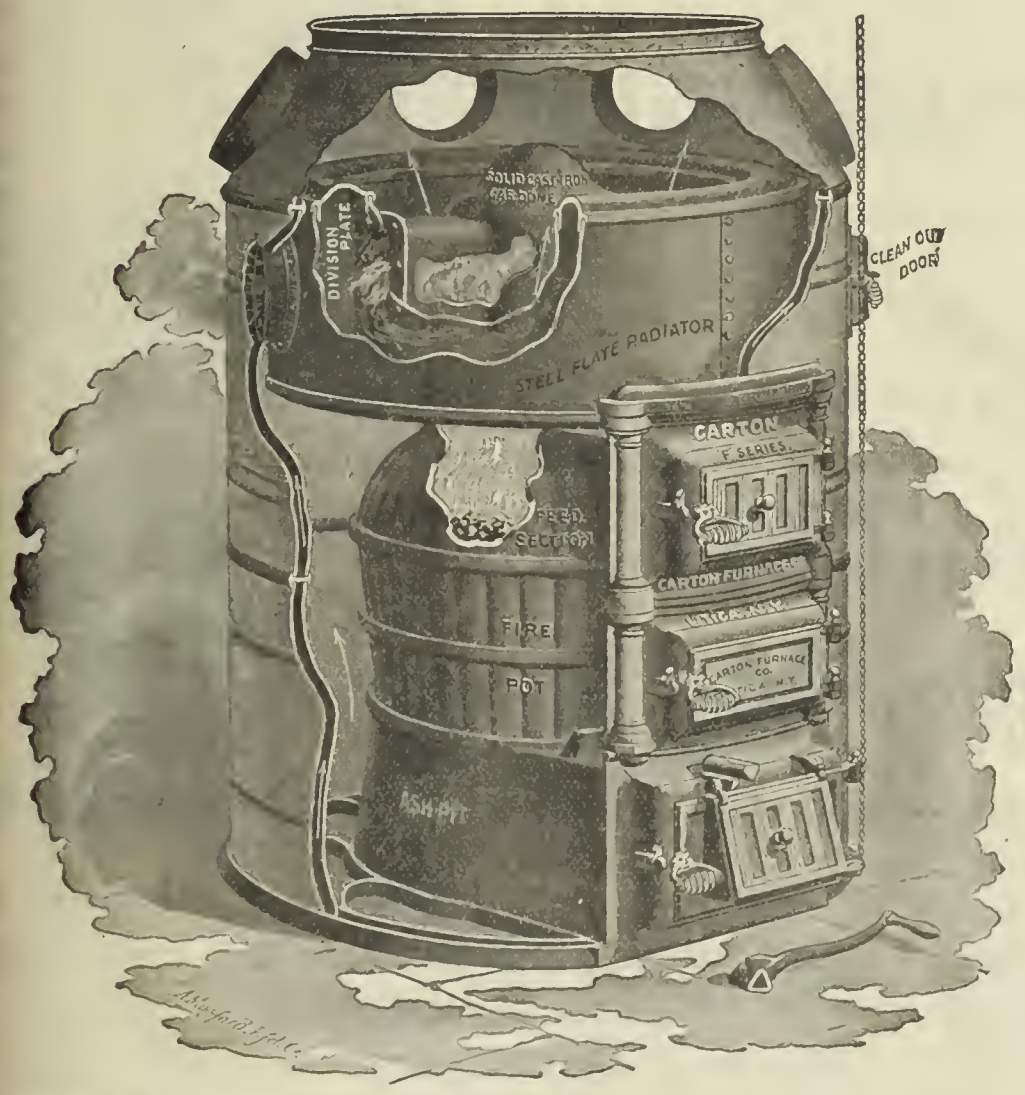

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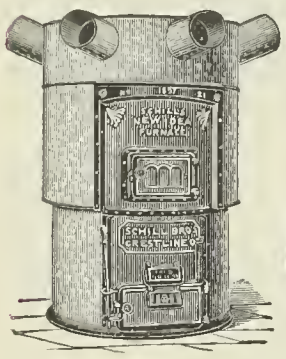

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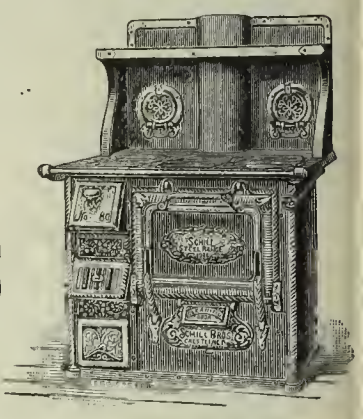

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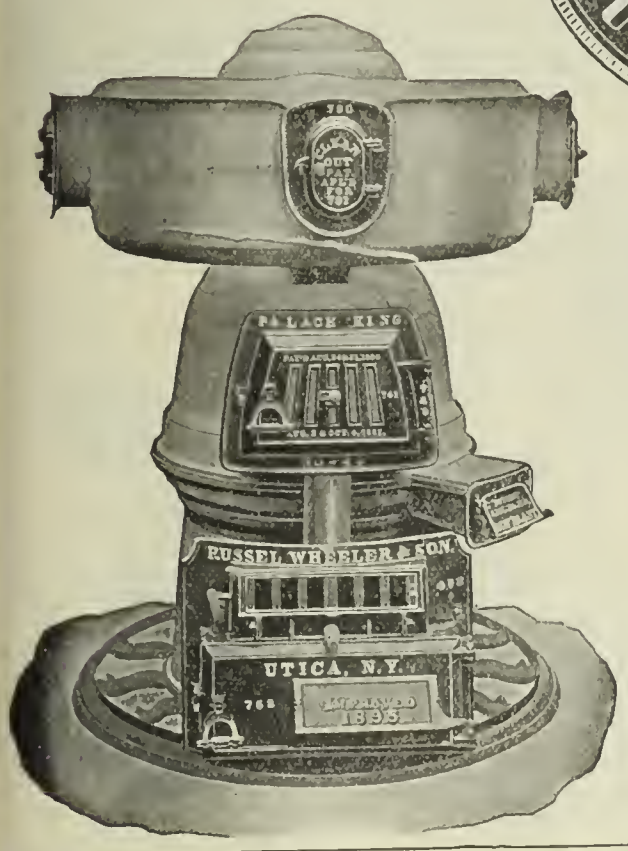

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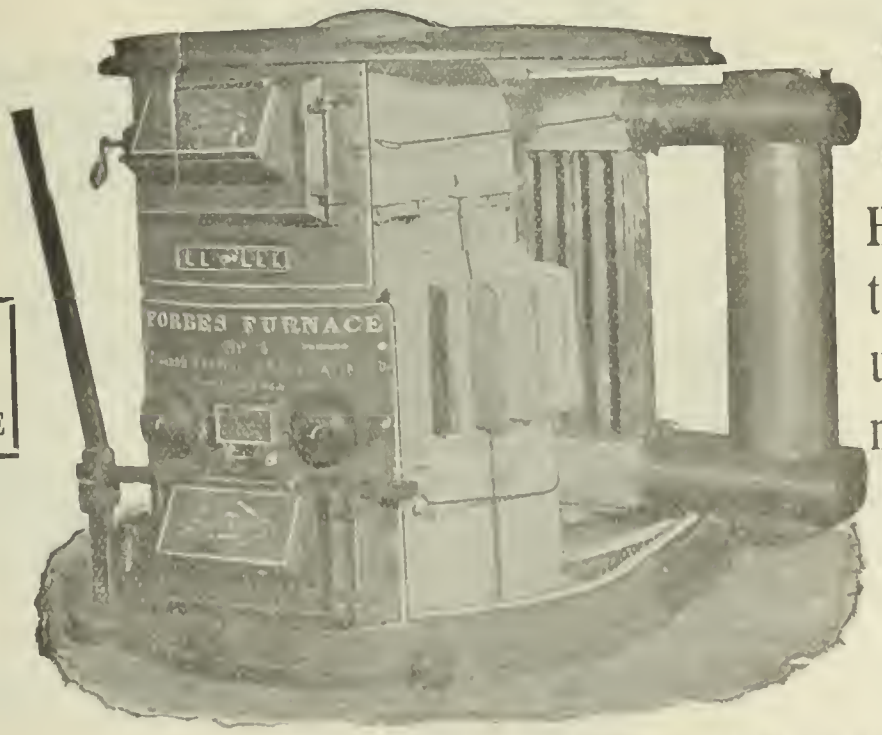

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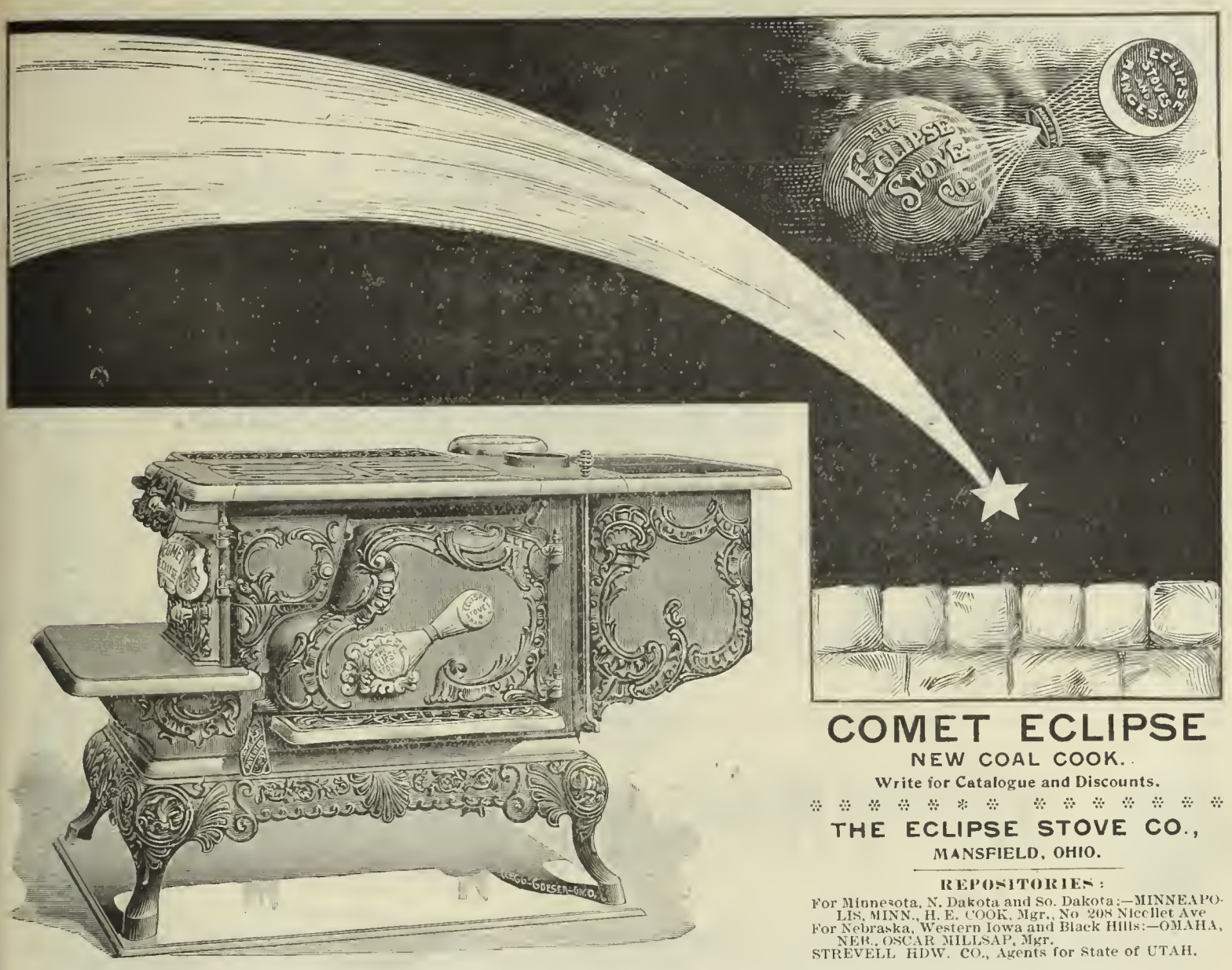

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SAVES ONE-HALF THE COAL.

Pa'ented in the United States and all foreign countries.

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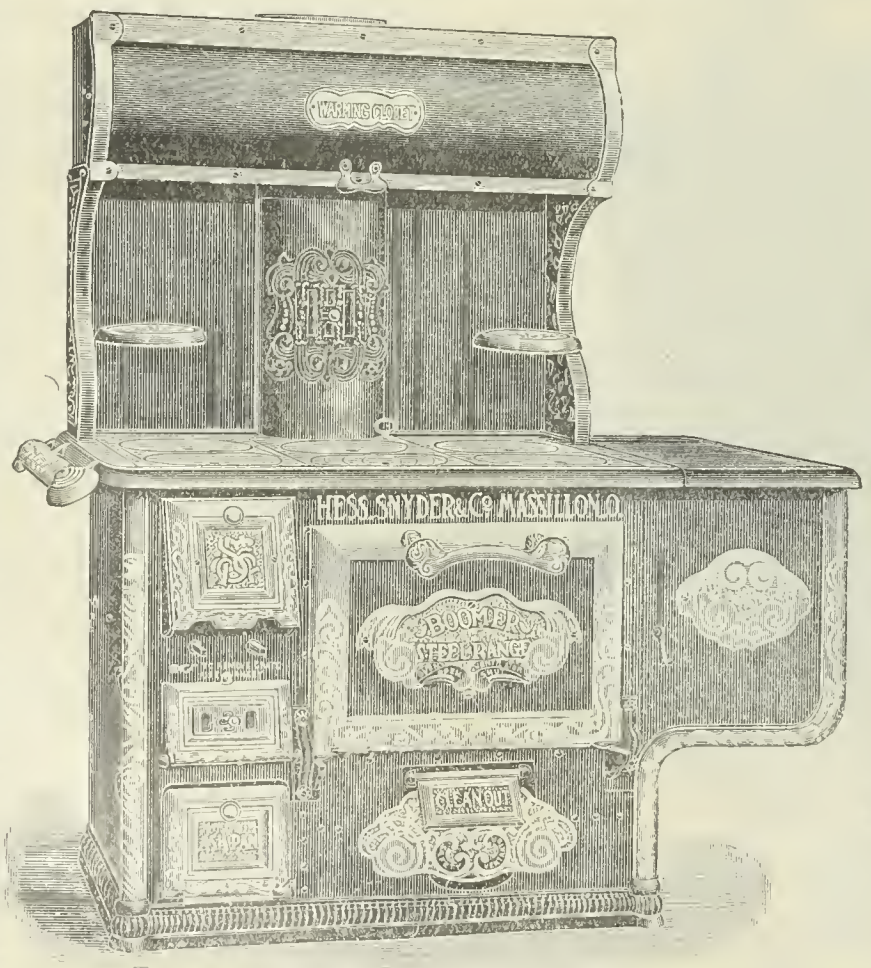

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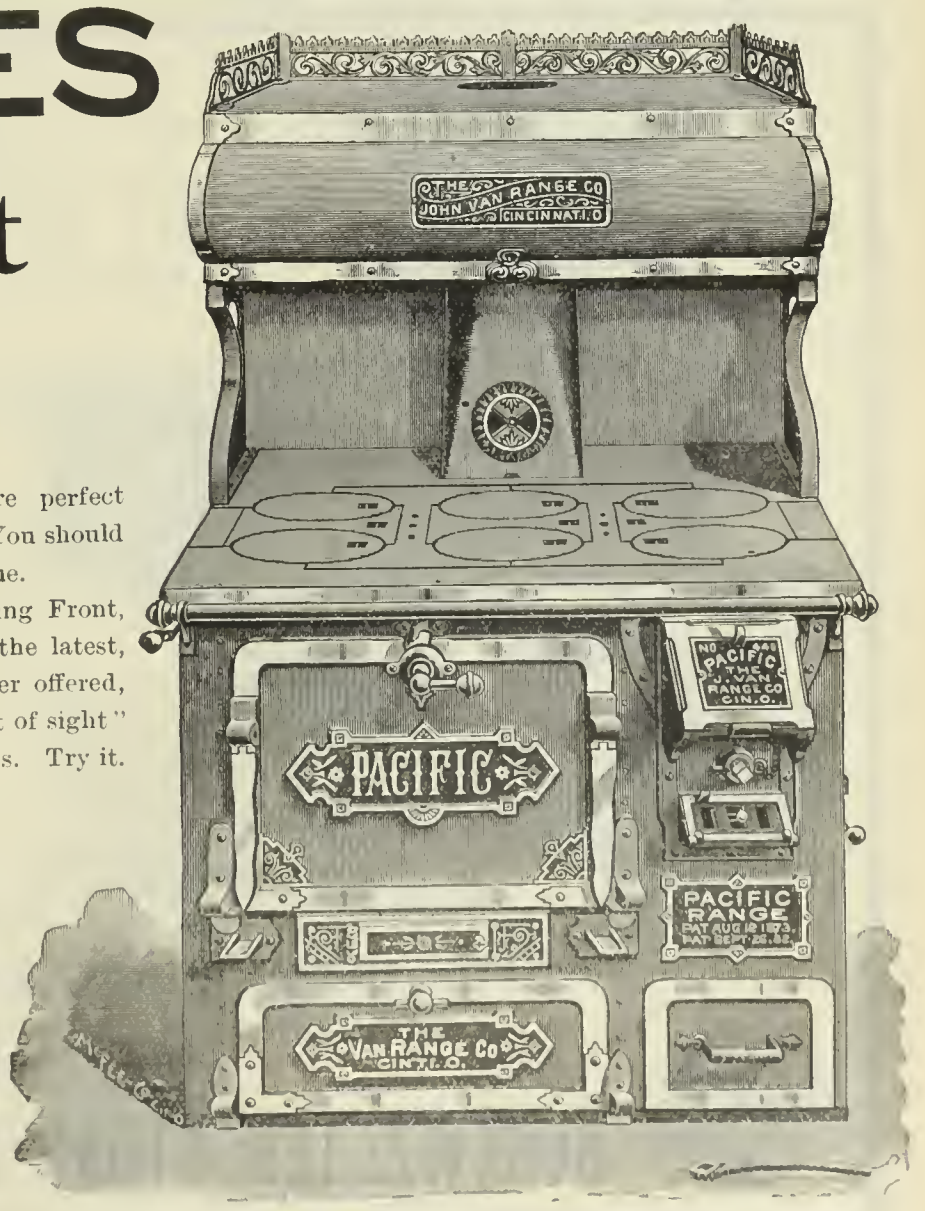

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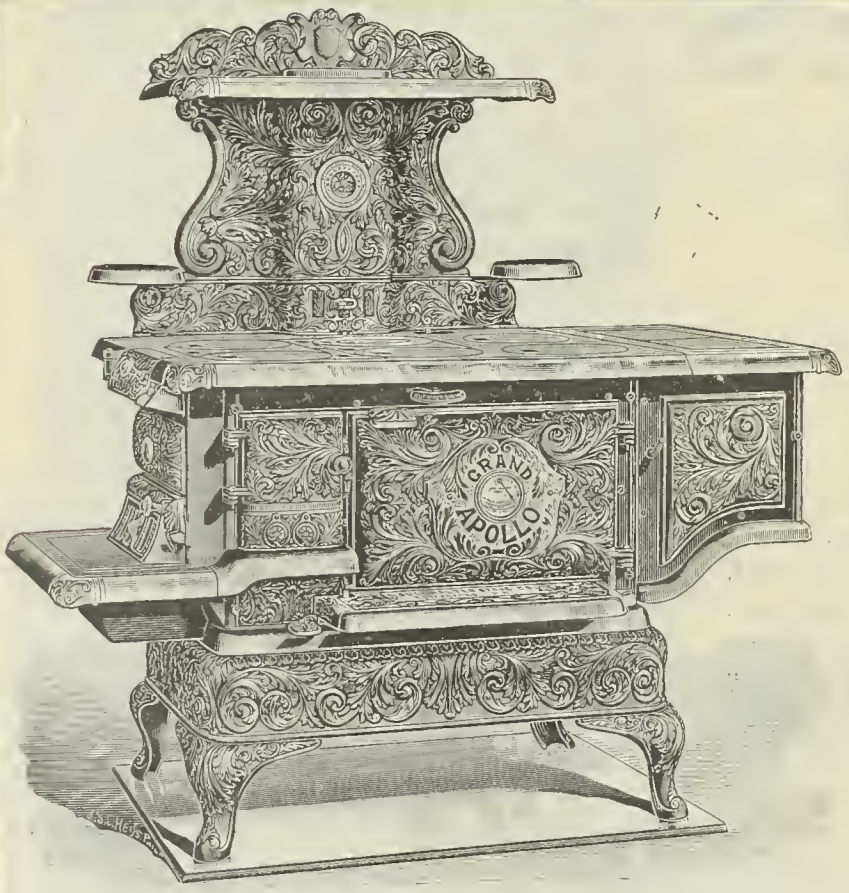

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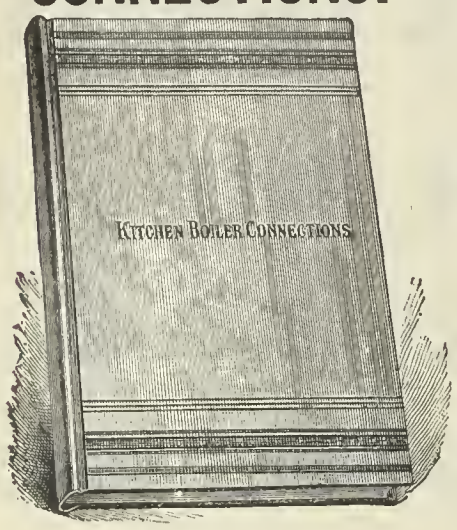

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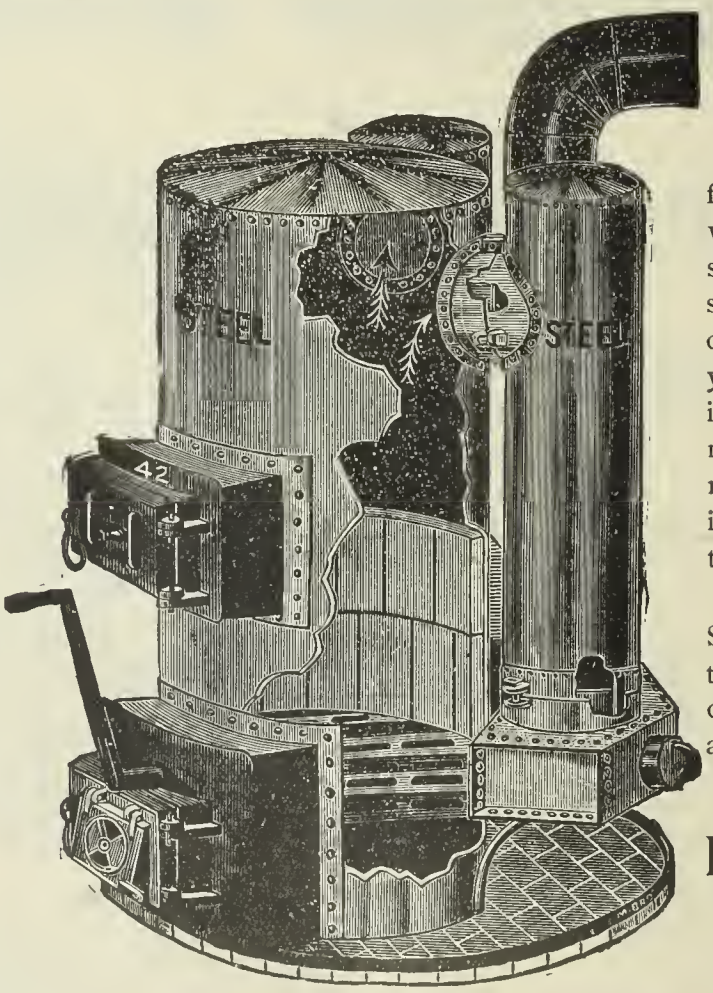

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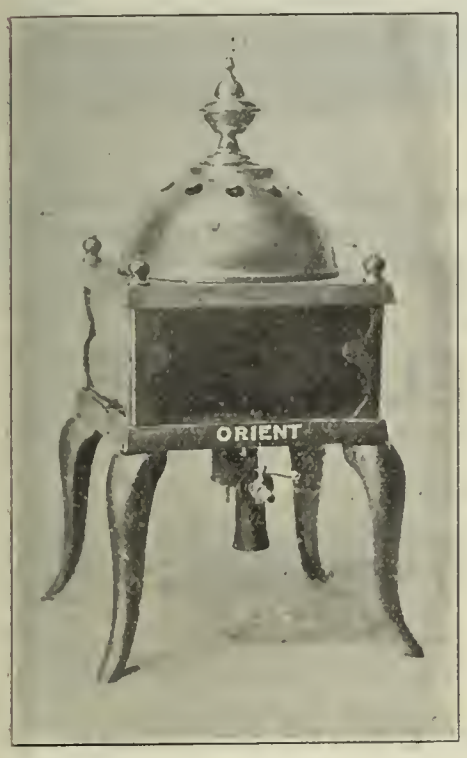

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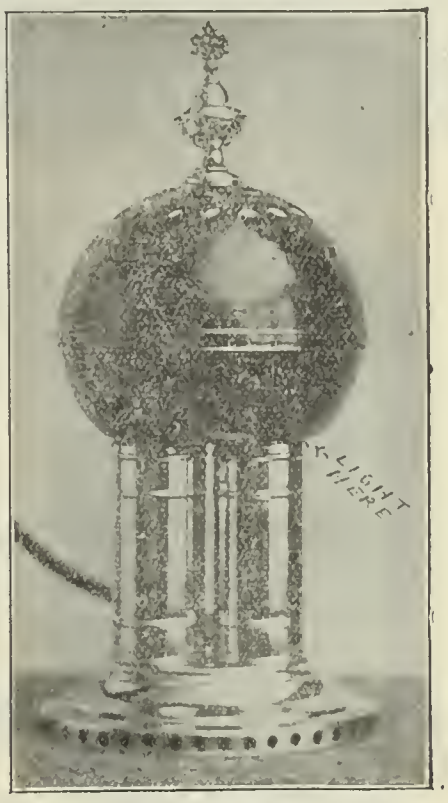

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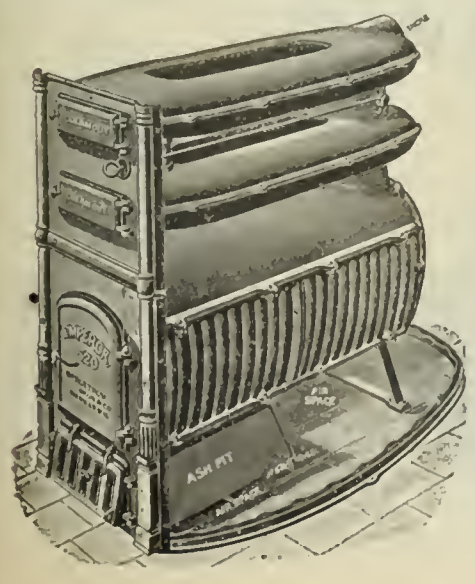

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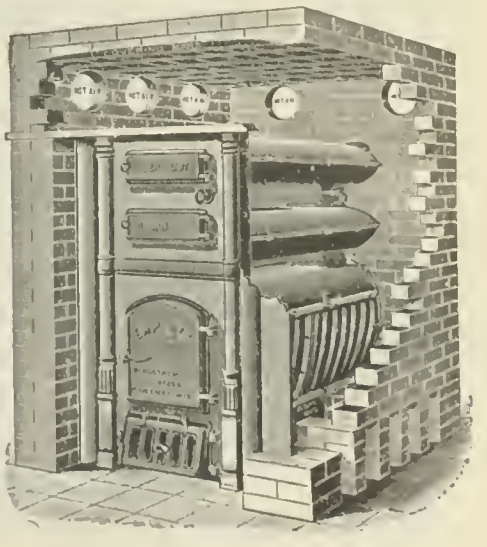

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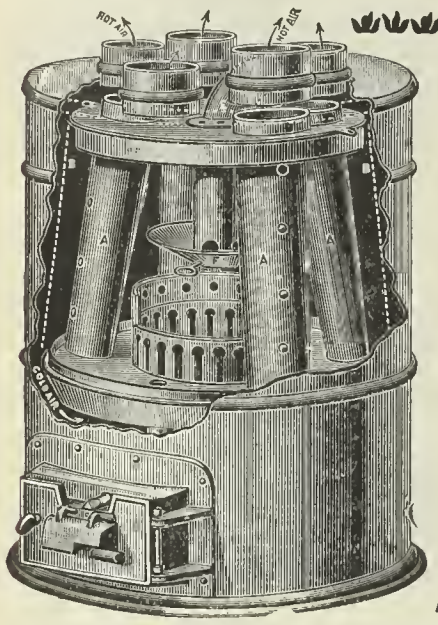

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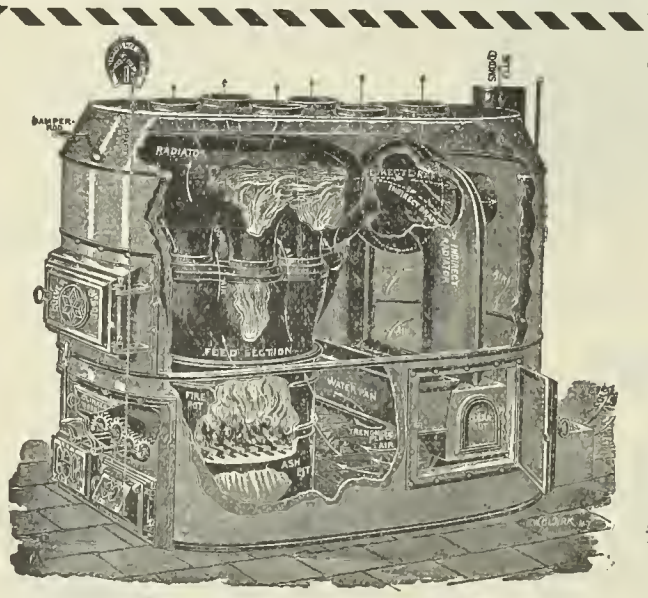

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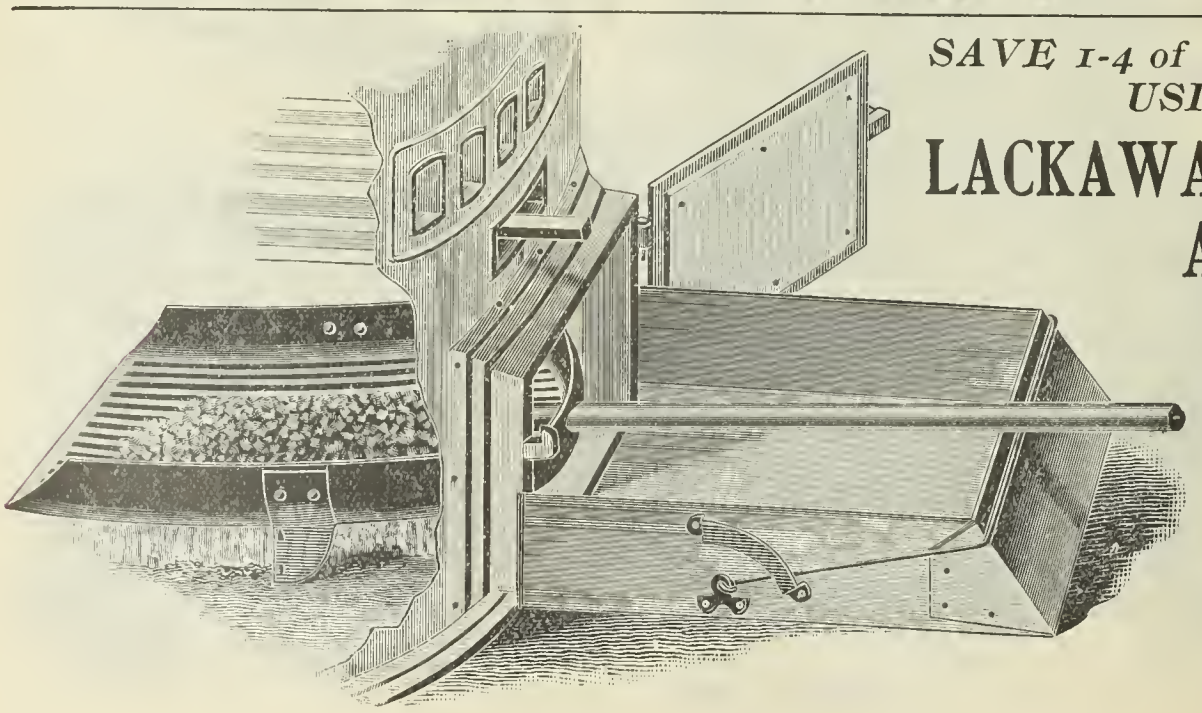

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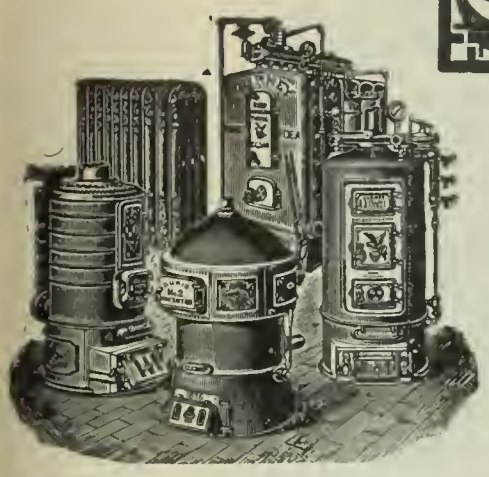

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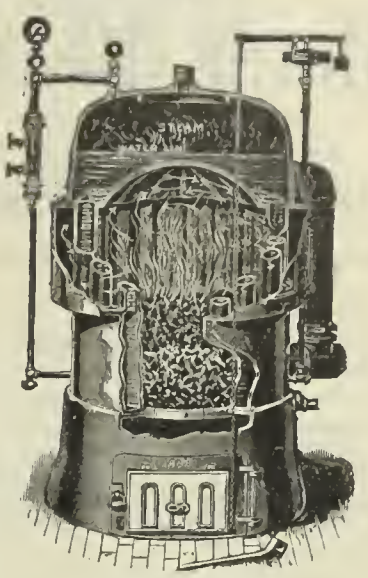

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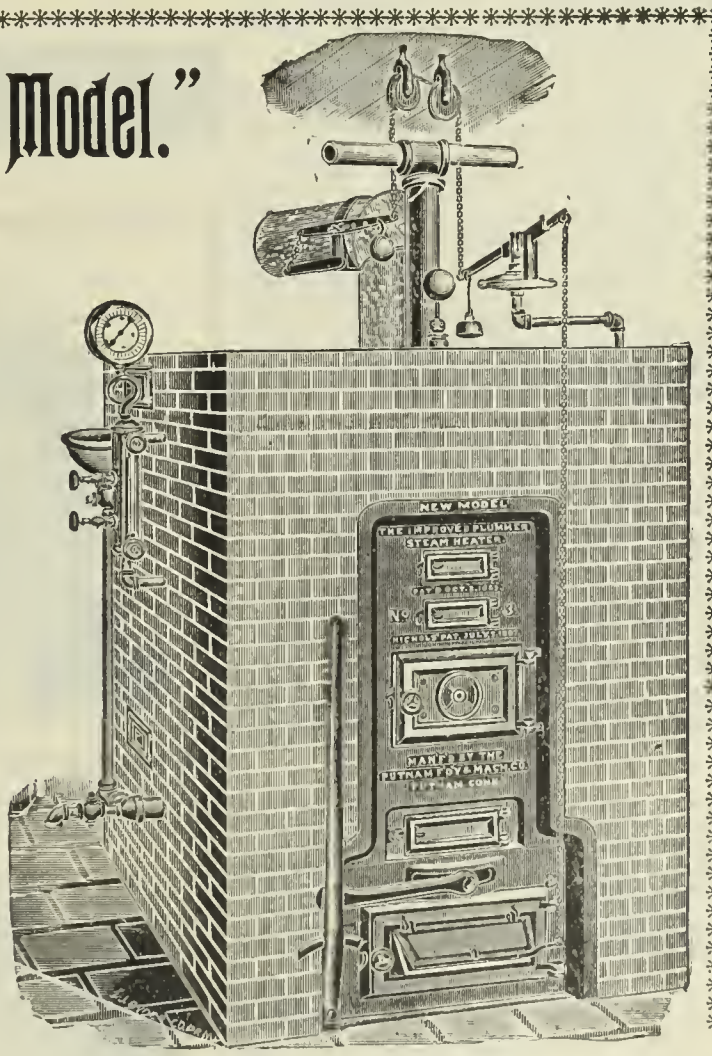

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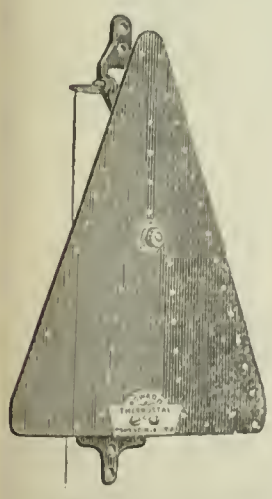

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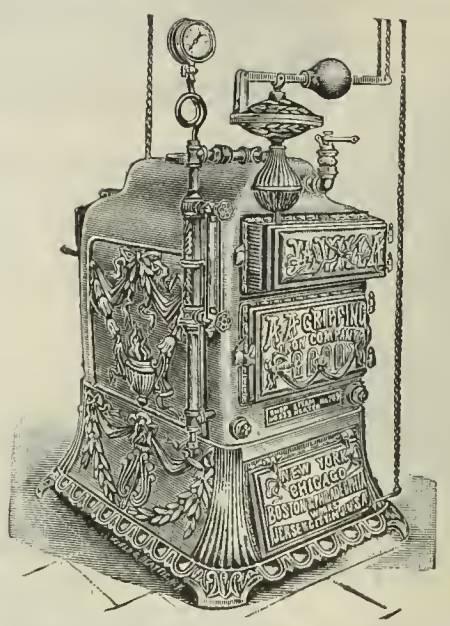

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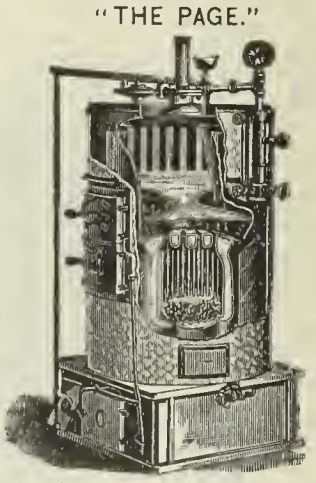

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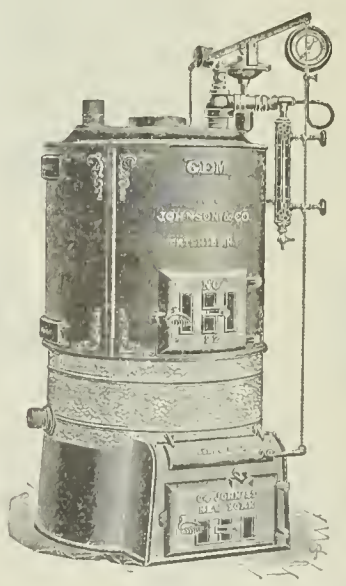

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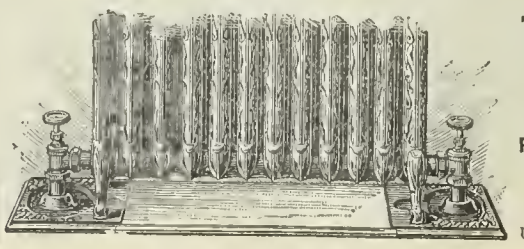

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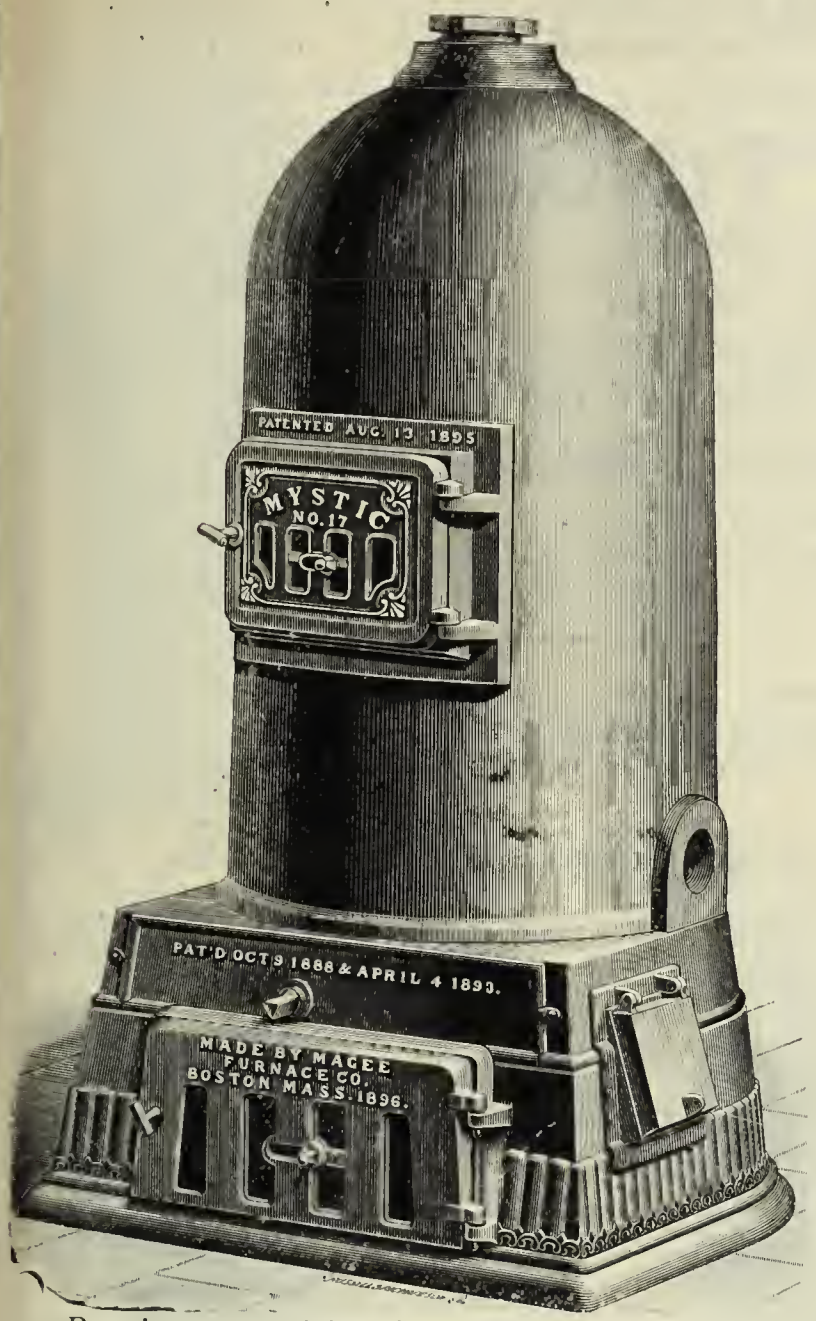

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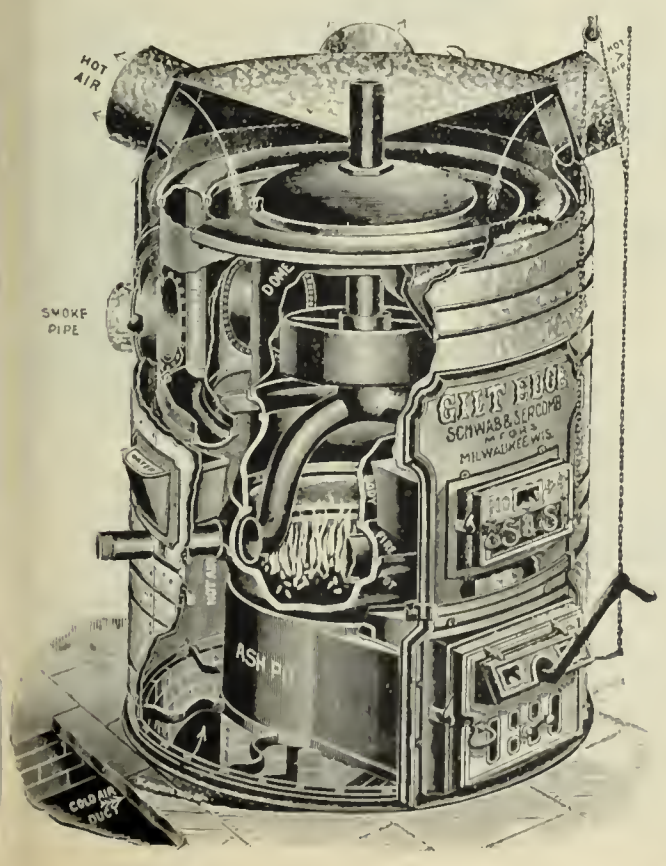

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IS NO EXPERIMENT.

Has Stood the Test.

Write us for Illustrated Circulars and Catalogues.

THIS IS A SAMPLE OF MANY TESTIMONIALS:

DELTA, OHIO, May 20th, 1897.

Messrs. SCHWAB & SERCOMB, Milwaukee, Wis.

GENTLEMEN:—The combination hot air and hot water heater that you placed in my residence in the fall of 1896 is perfect in its operation and entirely satisfactory in its heating results. There are nine hot water radiators and ten hot air registers, making a perfect distribution of heat. You may refer anyone to me for the strongest endorsement of this system.

Yours very truly,

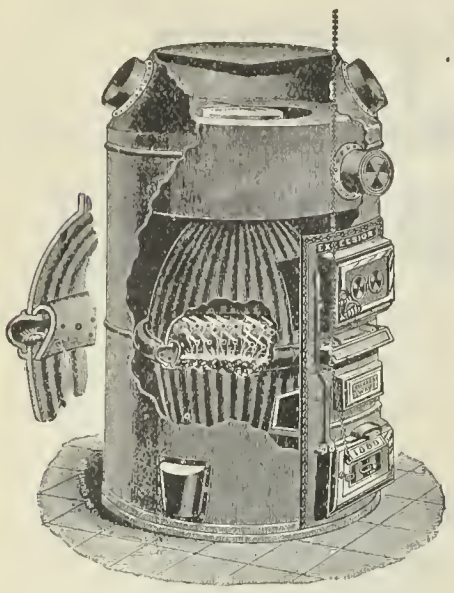
J. M. LONGNECKER.

We make Warm Air Furnaces adapted to any fuel or climate.

SCHWAB & SERCOMB,

E. E. DUNNING,
Manager Heating Department.

MILWAUKEE, WIS.



FURNACES
AND
FITTINGS.

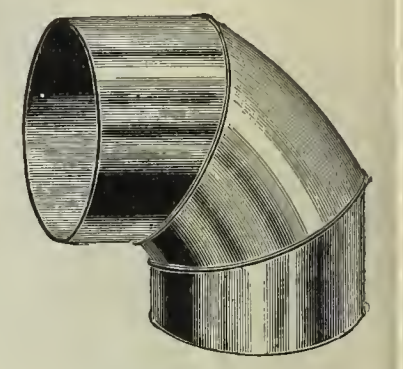
ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

THE EXCELSIOR STEEL FURNACE CO.,

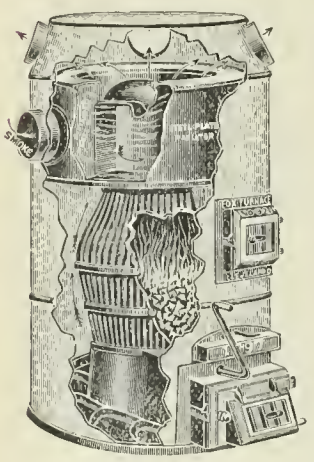
38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.



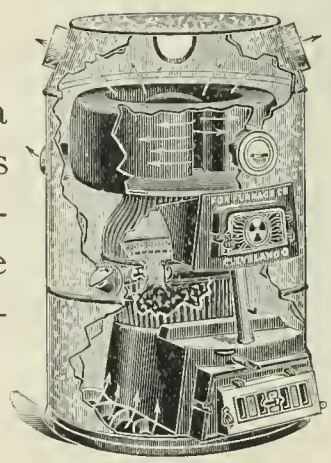
TOP RETURN FLUE.

The Fox Furnace Co.,

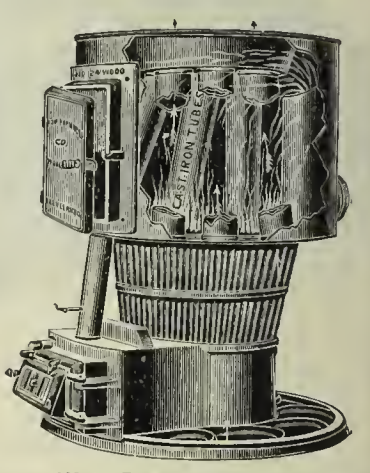
Seneca, Noble and Bright Sts.,

Cleveland, Ohio.

Have you a **Fox** Furnace? If not, let us interest you in them. A descriptive catalogue and price list will be sent you on application.



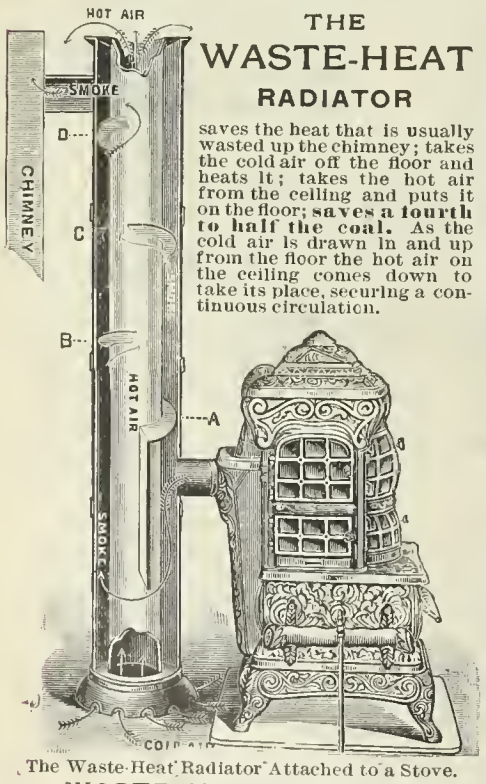
ALL CAST IRON.



WOOD AND COAL.

No. 36 La Salle St., CHICAGO, ILL.

The Moncrief-Dowman Co., = = Atlanta, Ga.



The Waste-Heat Radiator Attached to a Stove.

THE WASTE-HEAT RADIATOR

saves the heat that is usually wasted up the chimney; takes the cold air off the floor and heats it; takes the hot air from the ceiling and puts it on the floor; **saves a fourth to half the coal.** As the cold air is drawn in and up from the floor the hot air on the ceiling comes down to take its place, securing a continuous circulation.

TO STOVE AND FURNACE DEALERS:

DEAR SIRS:—The Waste-Heat Radiators have been in use in Minnesota and other parts of the Northwest, where the thermometer often registers thirty to forty degrees below zero, for the past three years and have been thoroughly tested, so they are no experiment; but until within the past few months, they have been made only in a limited way, as each one had to be made to order, owing to the difference in the height of the collars on different stoves and furnaces, but now we can make them with sliding collars and that they can be adjusted to fit any stove or furnace, therefore can make them in large quantities and do a general business in them.

The following people have used them during the past two or more years, to any of whom we refer: W. W. Rand, Sec'y Minneapolis Gas Light Co., Minneapolis, Minn.; J. C. Oswald & Co., Minneapolis, Minn.; Wm. Cunningham, St. Paul, Minn.; R. A. Lanpher & Co., St. Paul, Minn.; M. M. Gasser Co. Duluth, Minn.; W. W. Schiffman, Duluth, Minn.

The letter printed herewith from Mr. Clifford Hubbell, Cashier of the Columbia National Bank, Buffalo, N. Y., speaks for itself.

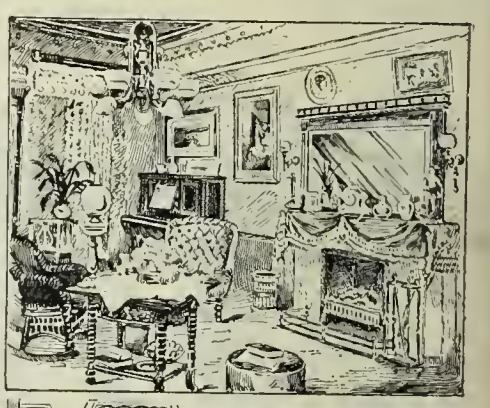
COLUMBIA NATIONAL BANK OF BUFFALO.
JOSIAH JEWETT, President.
CLIFFORD HUBBELL, Cashier.

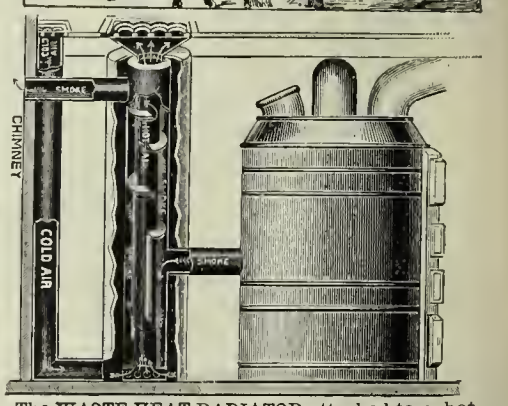
BUFFALO, N. Y.

DEAR SIRS:—Regarding the Waste-Heat Radiator which you placed in my residence, No. 71 Highland Ave., I have to say that it has worked admirably. I believe that the furnace burns 25% less coal now than formerly, and I think that that percentage is a very low estimate. In my mind the greatest advantage is that it draws the cold air from that part of the house where the cold air most accumulates, and makes the temperature in the rooms much more even, conducing thereby to comfort and healthfulness. I know that my wife, being skeptical about patent inventions of any kind, before this was put in, has come to acknowledge that this accomplishes the purposes for which it was purchased; viz., to save a large portion of the waste heat that goes up the chimney, and to save in the amount of coal burned, and make the temperature more even.

Yours respectfully,
CLIFFORD HUBBELL, Cashier.

In order to introduce our Radiators we will send one to any reliable Stove or Furnace Dealer and if he finds it as we represent it then we want him to buy it and take the exclusive sale of them in his city; otherwise to hold it subject to our order. Yours truly,





The WASTE-HEAT RADIATOR attached to a hot-air furnace; attaches to steam and hot-water boilers in the same way.

WASTE-HEAT RADIATOR CO., BUFFALO, N. Y. (Eastern Depot.)
T. H. GREEN & CO., DULUTH, MINN. (Western Depot.)

The Mitchell Water Heater.

Has no Joints to Burn Out or Leak.

Heating Surface all in One Casting.

Water Passages all Vertical.

Largest Amount of Fire Surface

OUR 100 SERIES FOR STEAM OR HOT WATER.

Is constructed on the same general principle, but arranged to be used without jacket.

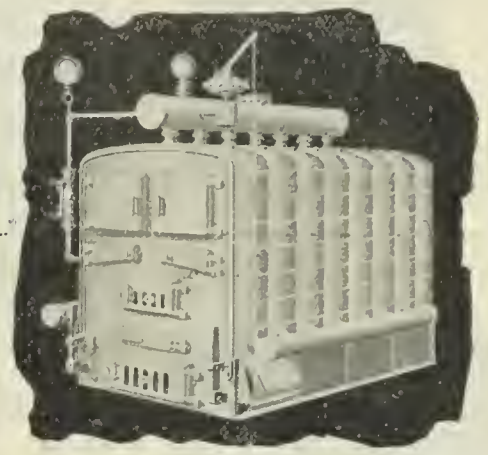
If you have competition and want to make a low estimate to secure the job, we can help you do it.

Write for . . . . Catalogue and Prices.

THE MITCHELL HEATER CO., 50-60 Pine St., POUGHKEEPSIE, N. Y.

1/4 Time 1/5 Expense.

This heater can be taken through ordinary doorways. Set up ready for work in ¼ the time required to set any of the awkward one-piece heaters—at less than 1-5 the expense. Not necessary with



"American" Steam Heater

to cut openings into walls of boiler room for its admission, or to excavate under walls. *Get "American" Book.*

American Boiler Company

CHICAGO: 84 Lake Street.
NEW YORK: 94 Centre Street.

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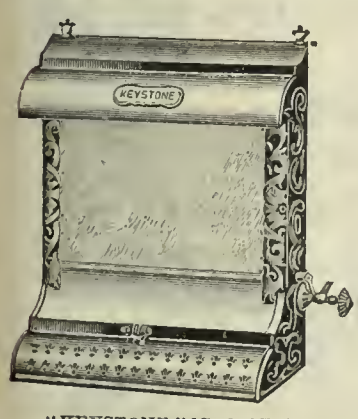

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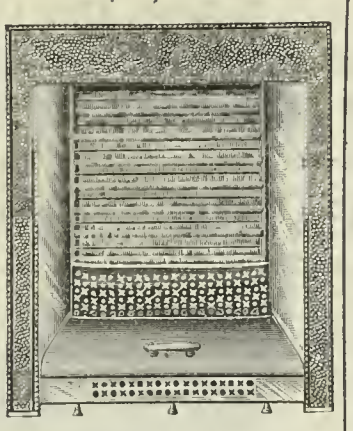
Gas Stoves,
Gas Fires,
Gas Lights,
Gas Fixtures.

Supplies for fuel and illuminating gas.

Write for new catalog "M."

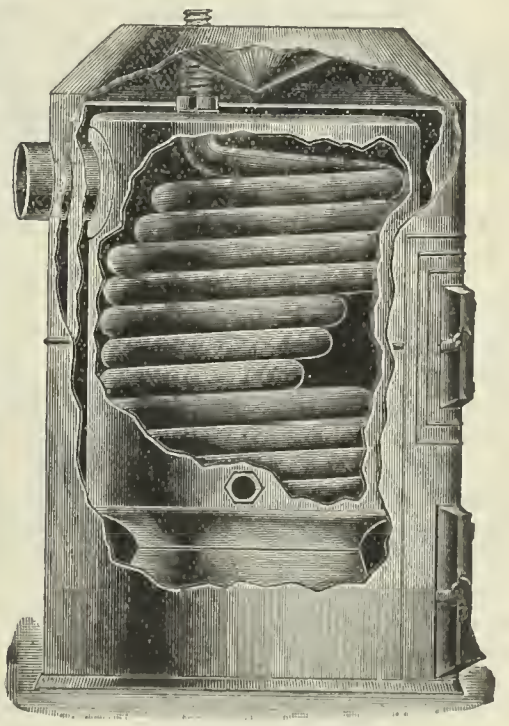


"CENTURY" GAS FIRE.

Reineke, Wilson & Co.

13 and 15 Wood Street - - - - PITTSBURG, PENNA.

THE COMBINATION HOT WATER HEATER



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HOUSES, STORES, CONSERVATORIES, and BATH ROOMS

by the combination of hot air and hot water if desired, or hot water alone.

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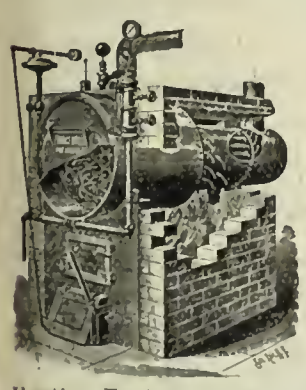

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for Public and Private Buildings and Greenhouses. Adapted to burn hard or soft coal.

Heating Engineers with an experience of over 20 years.

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Manufacturers and Importers of

Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

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Tuttle & Bailey Registers and Ventilators.

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It is the finest Range on the market.

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The Somerset Grand Parlor.

Send for Catalogue.

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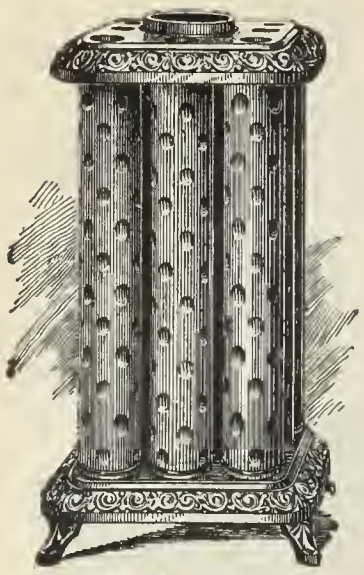

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DO YOU WANT TO INCREASE YOUR BUSINESS?

You can do so. There is no question about it at all. An article that will make one fire do the service of two fires finds many buyers as soon as people know about it.

New Era Radiators

do this, and there is a big profit on every one you sell. Drop us a card and we will send you a circular telling all about these Radiators and our special inducements for handling them. Do it now, so as to be ready for the opening of the season.

WILMOT CASTLE & CO., 76 Elm St., Rochester, N. Y.

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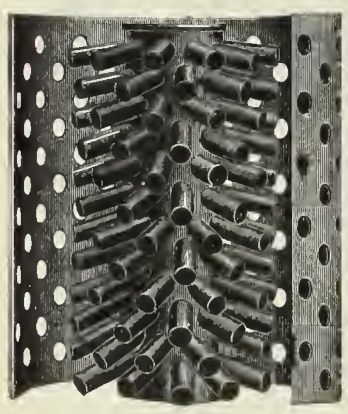
SAVES 1/2 THE FUEL.



4,866 sq. ins.

THE "ROCHESTER" RADIATOR.

FOR USE ON FURNACES AND STOVES.

Manufactured ONLY by the Rochester Radiator Co.

Made in 7 Styles, and Retails from $3.25 up.

IT DOES NOT INJURE THE DRAFT, LEAK GAS OR CLOG.

Do not be misled by other makes which claim to be

THE ROCHESTER RADIATOR.

WRITE FOR PRICES AT ONCE. LIBERAL DISCOUNT TO THE TRADE.

100 FURNACE ST., ROCHESTER RADIATOR CO., ROCHESTER, N. Y.

BLODGETT'S PATENT PORTABLE OVEN

FOR

Hotels,
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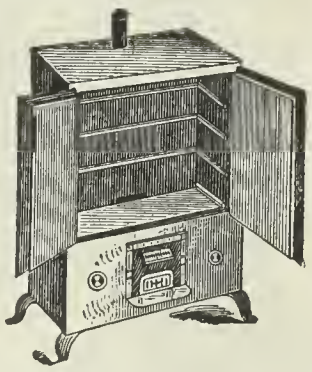

The only Oven Baking by Perfect Circulation of Hot Air.

Made in ten sizes. Send for Catalogue.

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THE G. S. BLODGETT CO., Mfrs.

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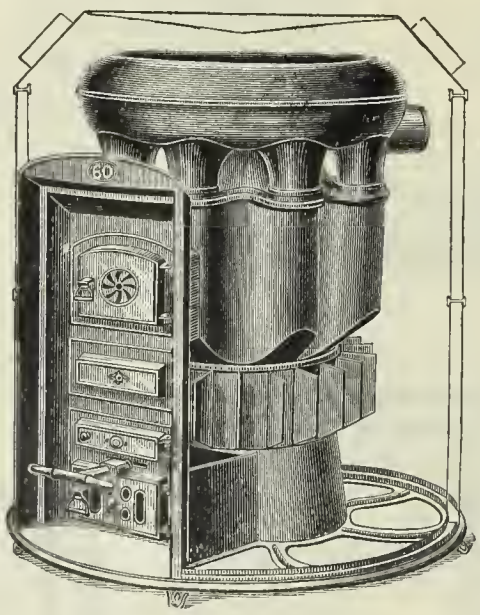

CORY'S Gas-Tight Single Section HEATERS.

Large Surfaces—all good. No "Steel" or "Sheet Iron" to rust out.

ALL CAST IRON.

No Bolted Joints.
Twenty Sizes.
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Established 1847.

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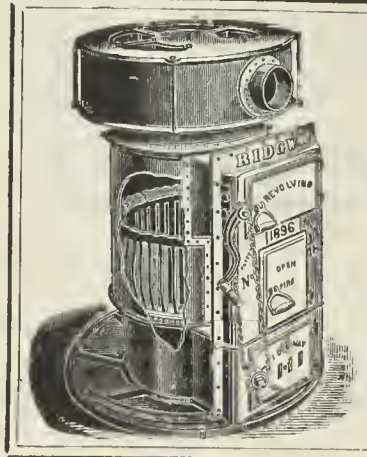

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OPEN FIRE POT FURNACES.

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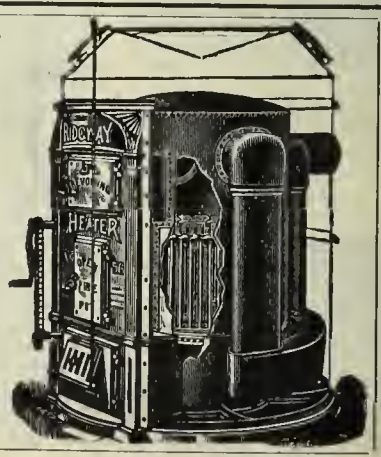

—A PUZZLING QUESTION.—Frances (four years old)—"Mamma?" Mamma—"What is it, dear?" "You never saw me before I was born, did you? "No, love." "Then how did you know it was me?"—*Harlem Life.*

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UNEXCELLED FOR

STRENGTH,

FINISH,

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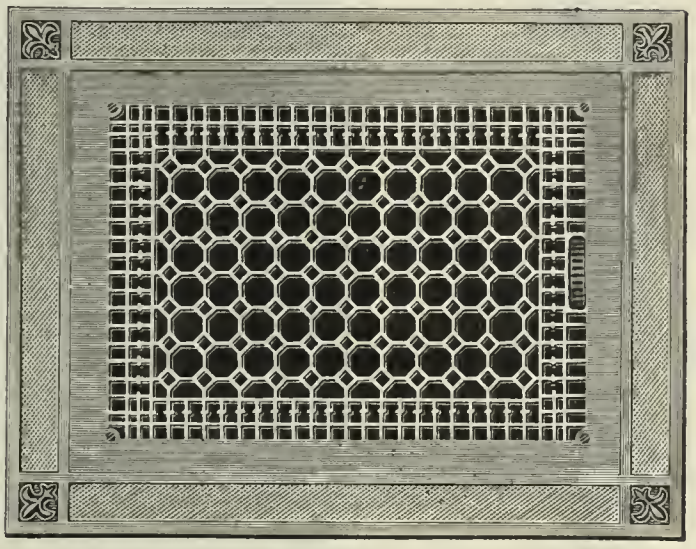
DESIGN.



Complete List of Sizes.

FULL :: STOCK CARRIED.

NET ESTIMATES ON SPECIAL JOBS SUBMITTED.

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Stove, Furnace and Range Repairs.

Largest Line, Largest Variety, Largest Stock

IN NEW ENGLAND.

Water Fronts, Brick Linings, Repair Castings.

Promptness in Filling Orders Guaranteed. Send for Latest Catalogue.

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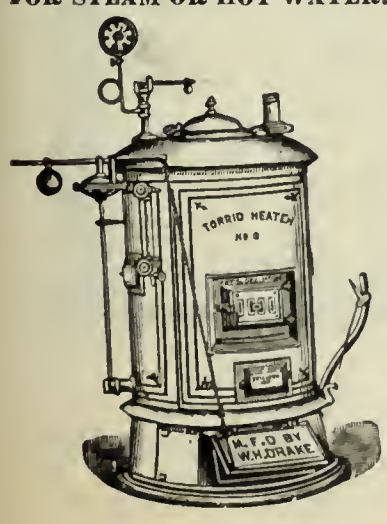
"TORRID" HEATER.

FOR STEAM OR HOT WATER.



IT IS PRACTICAL IN DESIGN.
IT IS SAFE, BEING TESTED TO 200 POUNDS.
IT IS EASY TO MANAGE AND KEEP CLEAN.
IT IS DURABLE.
IT IS SECTIONAL AND EASILY HANDLED.
IT HAS NO PACKED JOINTS.
IT IS SELF-FEED OR SURFACE BURNING.
IT HAS THE TORRID PATENT ROCKING AND DUMPING GRATE.
IT IS LOW IN PRICE.

SEND FOR CATALOGUE.

MANUFACTURED BY

W. H. DRAKE No. 36 Clinton St. NEWARK, N. J.

FACTORY: HACKETTSTOWN, N. J.

—POINTER ON SQUEEZING.—A little black-eyed and nimble-tongued Irish street car conductor on a branch of Boston's West End Railroad is a source of no end of amusement to the passengers along his route by reason of some of his startling utterances.

One day he came into the car and called out in his peculiarly penetrating voice: "Wan seat on the roight! Sit closer on the roight, ladies and gintlemen, an' mek room for the leddy phwat's standing."

A big surly-looking man who was occupying space enough for two, said, sullenly:

"We can't sit any closer."

"Can't yeez?" retorted the little conductor. "Begorry, you niver wint coortin', thin."

"It is needless to say that room was made "on the roight" for the lady.—*Harper's Bazar.*

Practical Gas Fitting.

Two illustrated articles describing How to Run Mains, Lay Pipes, and Put up Gas Fixtures.

116 Pages, 54 Illustrations, 5¾ x 8 inches, Cloth, Price, $1.00.

This is a concise and practical manual on the ***best methods of doing gas fitting.***

It fills a need experienced by American mechanics for a handbook giving ***plain and simple instructions*** in this important department of plumbers' work.

The book consists of two accounts, both by expert gas fitters.

Each account is complete in itself, and as they treat the subject quite differently the book will be found more particularly valuable and complete.

The numerous illustrations help to show how many things are done which are difficult to describe in words alone.

This manual is, in short, well adapted to the practical requirements of plumbers and gas fitters.

TABLE OF CONTENTS.

FIRST ARTICLE.

Introductory,
The Distillation or Manufacture of Coal Gas,
The Distribution of Gas from the Gas Holder Through the Town,
Connecting the Meter in Buildings,
Inspection of Material and Work,
Laying Out Pipe,
Gas Fitters' Tools,
Piping the Building,
Measuring Pipes,
Cutting the Pipe,
Finding Leaks,
Putting Up Fixtures,
Gas Logs,
Economical Gas Burning.

SECOND ARTICLE.

Introductory,
Locating the Lights,
Locating the Meter,
Making the Plan,
Getting Out the Pipe,
Piping the House,
Gas Fixtures and Fittings,
Piping Old Houses,
Frozen Gas Pipes.

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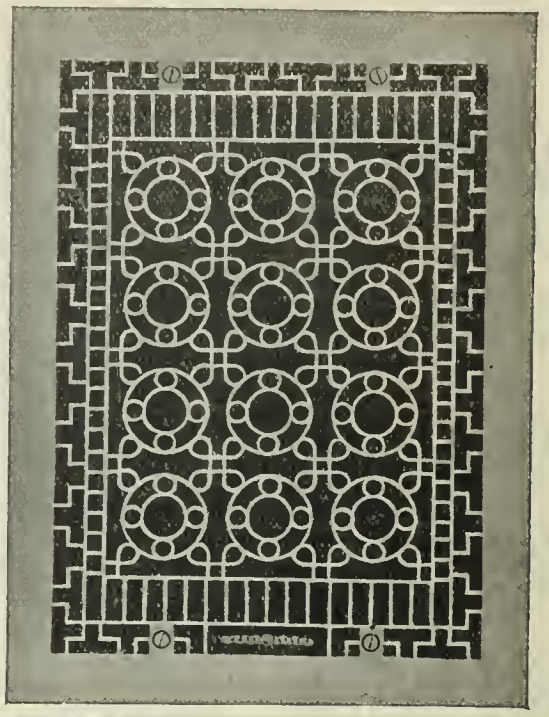

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Where can WESTERN BUYERS of HOT AIR REGISTERS send their orders and secure

Prompt Shipments, Low Freight Rates, Standard Sizes, The Best Finished Goods, The Lowest Prices?

THE ANSWER.

To the Largest Western Makers,

THE SCHREIBER & CONCHAR MFG. CO.,
DUBUQUE, IOWA,

Who carry in stock Black and White Japanned, Nickel, Brass, Bronze, Copper, and Antique Copper Finishes.

Send for Catalogue. *Write for Prices.*

If you write you saw "ad." in THE METAL WORKER, we will allow 1 per cent. extra discount on first order.

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ASSORTED PACKAGES.

Put up Expressly for the Retail Trade.

ONE POUND—4 SIZES.
¼ lb. Each Size.

North Carolina, $2.25	5 x 6	
Wyoming, . . 2.00	2¼ x 4	2½ x 3
Montana, . . 1.90	2¼ x 5	

TWO POUND—8 SIZES.
¼ lb. Each Size.

North Carolina, $4.25	2½ x 3¼	2¾ x 4
Wyoming, . . 3.70	2 x 4	2½ x 4
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	3½ x 5	5 x 7

THREE POUND—12 SIZES.
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North Carolina, $6.00	4 x 5½	3 x 4
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	2¼ x 4½	2¾ x 2¾
	2½ x 3	2¾ x 3½
	2 x 3½	5 x 7

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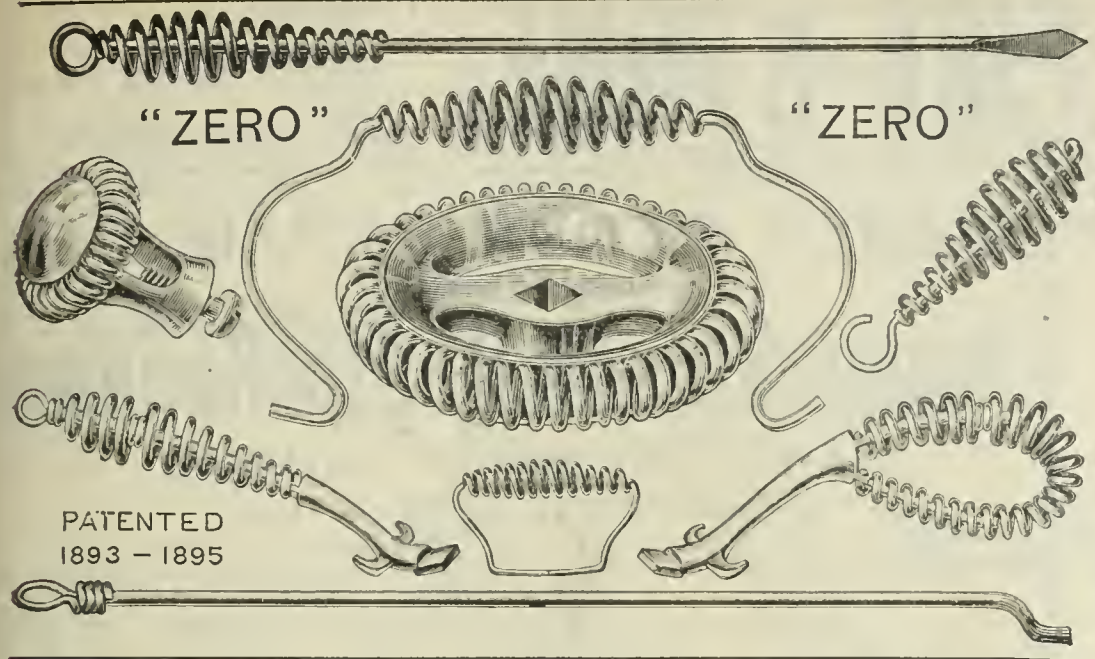

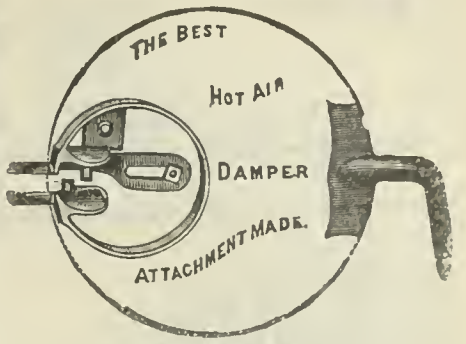

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WIRE GOODS.

Manufactured By

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WAFFLE IRONS.

The Best for Gas or Gasoline Stoves. Easy to Clean. Long Wood Handles.

Buy no Other.

"ERIE" HOLLOW WARE

ALSO COMPLETE ASSORTMENT OF

Full Nickel Plated Ware,

UNSURPASSED IN FINISH.

"ERIE" ALUMINUM CAST WARE,

The finest ware ever made. It will pay you to handle it.

New Goods for Spring Trade. **Send for New Catalogue.**

Try our Improved Double Broiler for Gas or Gasoline Stoves.

GRISWOLD MFG. CO., Erie. Pa.

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American Dampers and Clips are the Best

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BUY ONLY THE AMERICAN.

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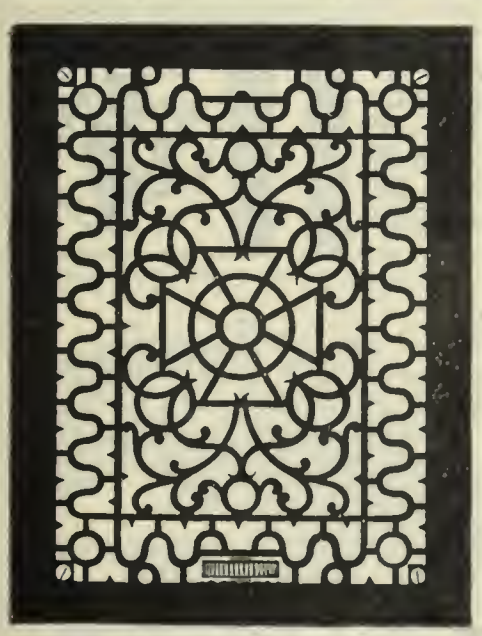

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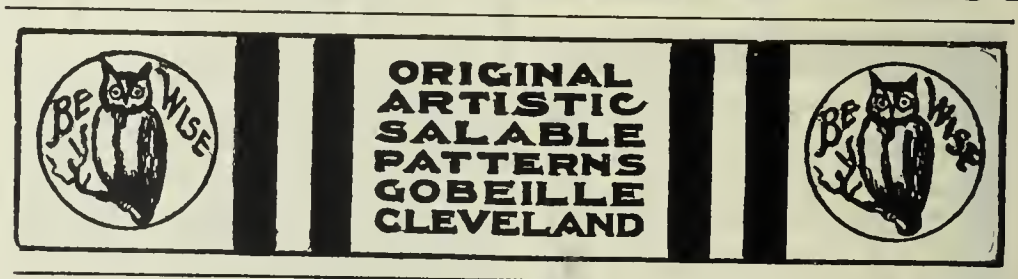

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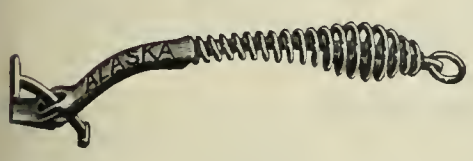

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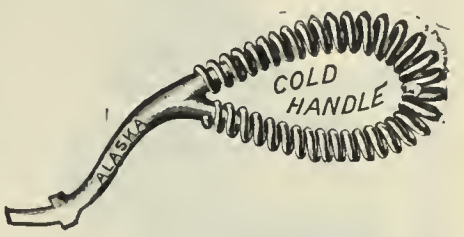

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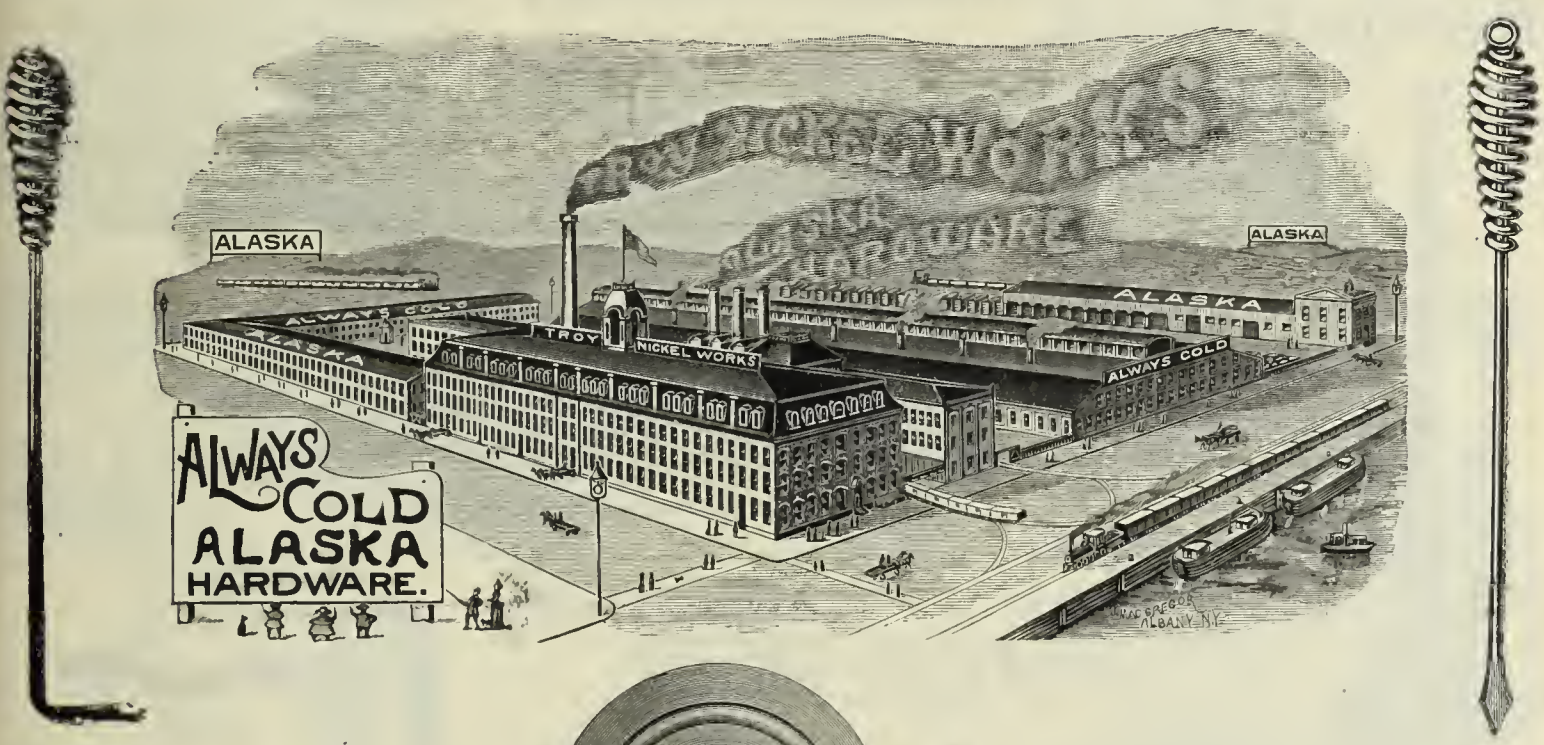

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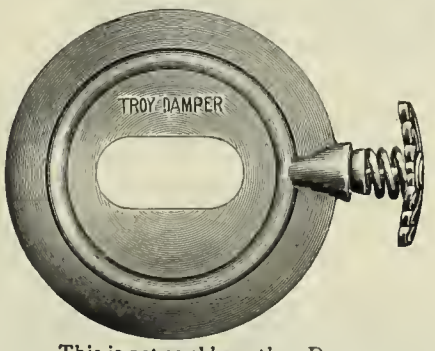

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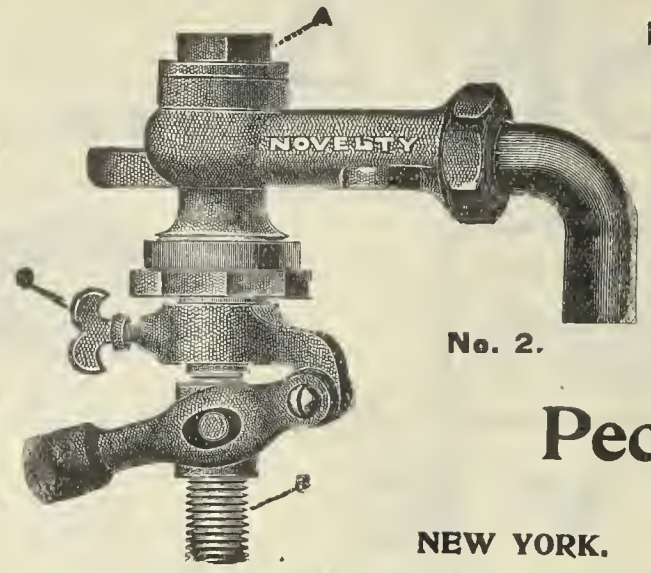

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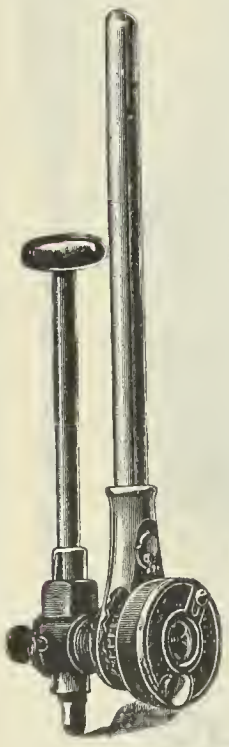

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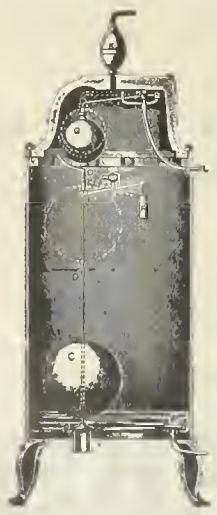

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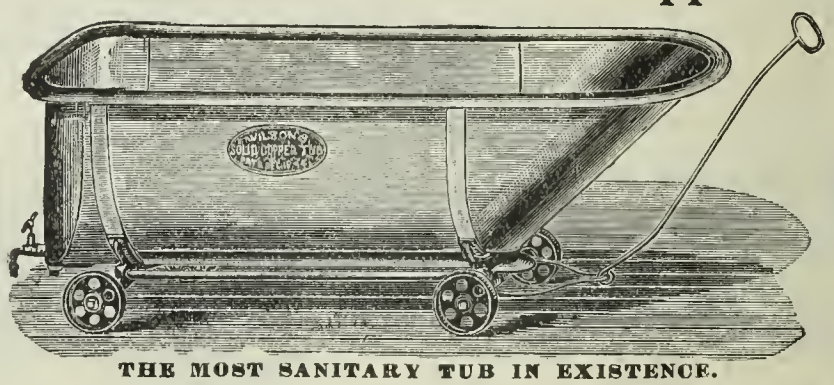

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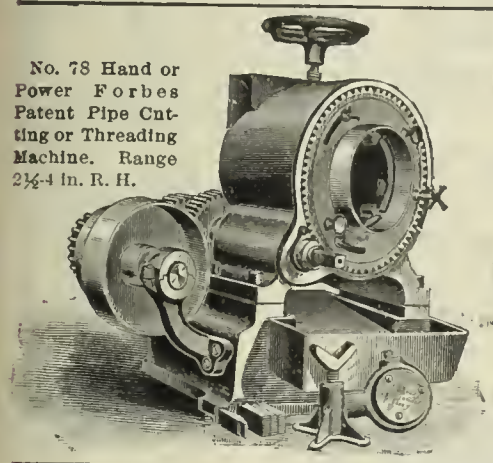

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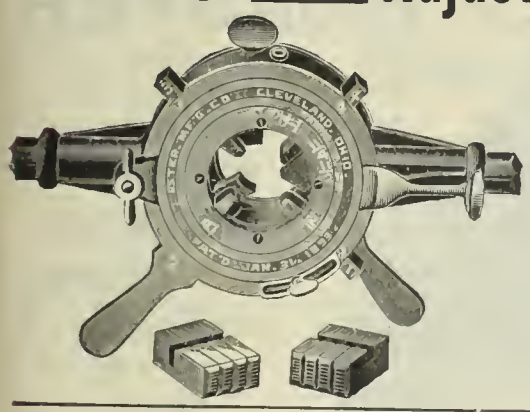

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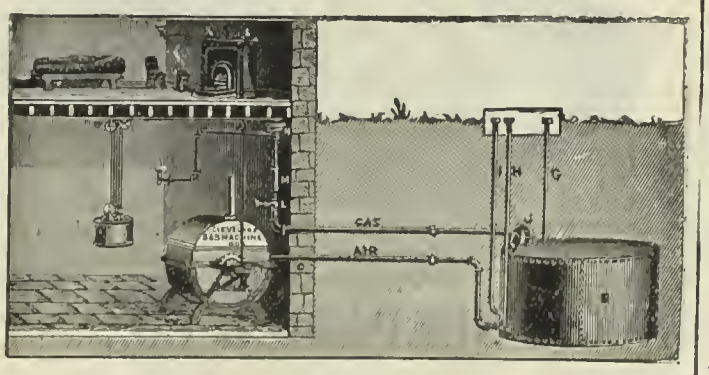

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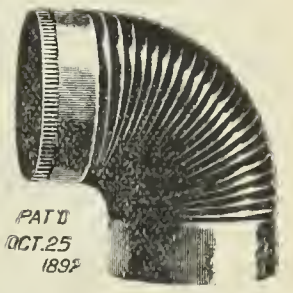

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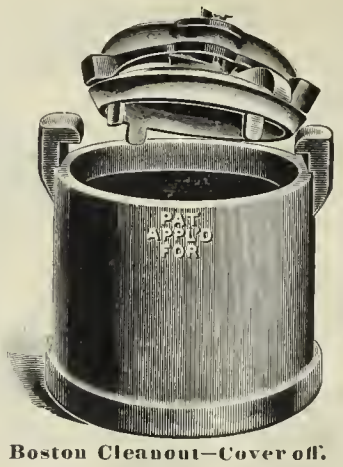

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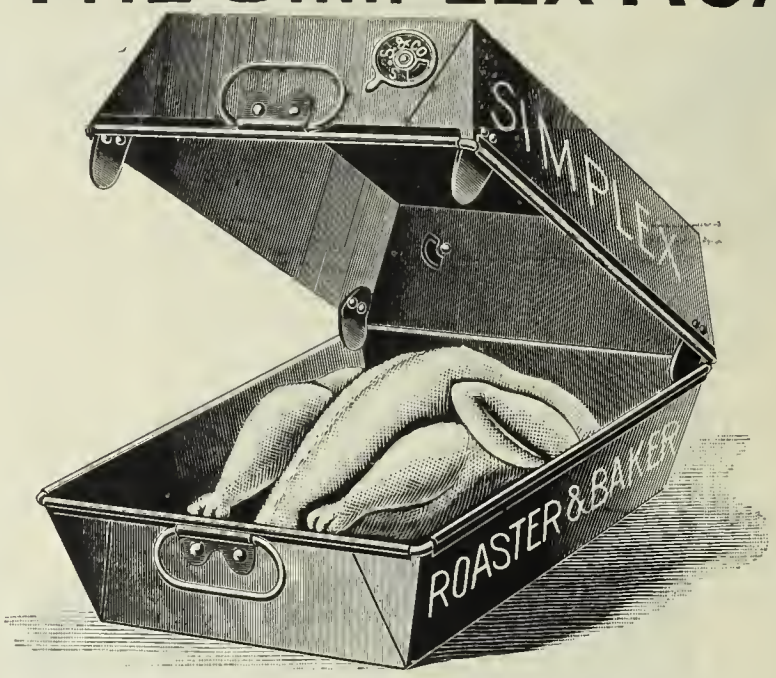

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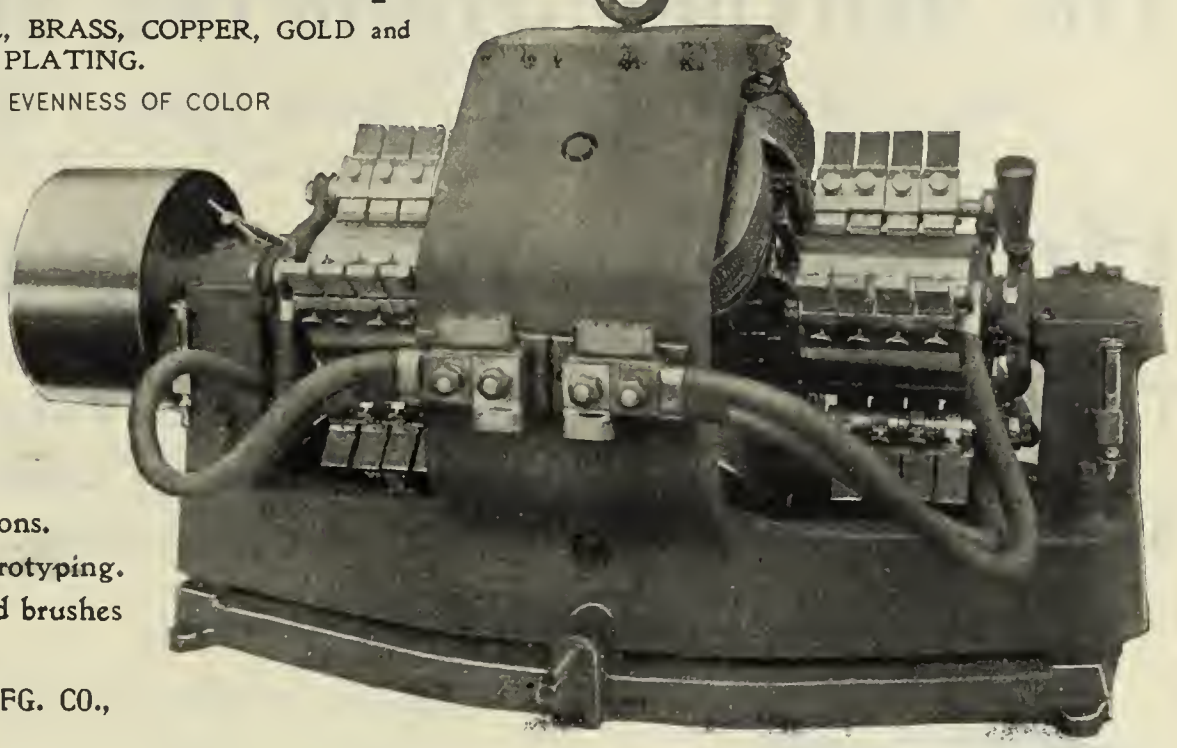

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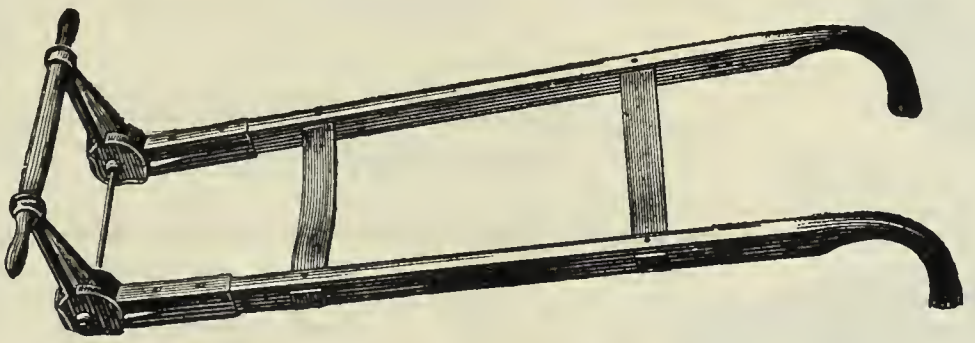

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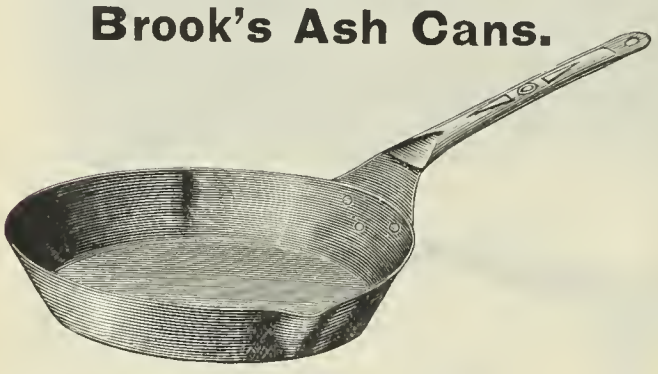

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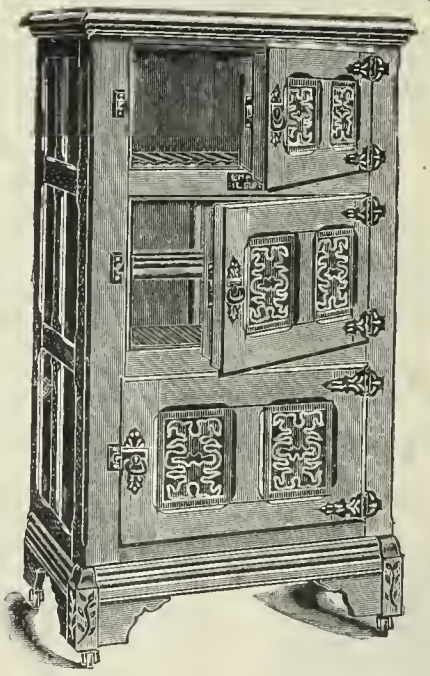

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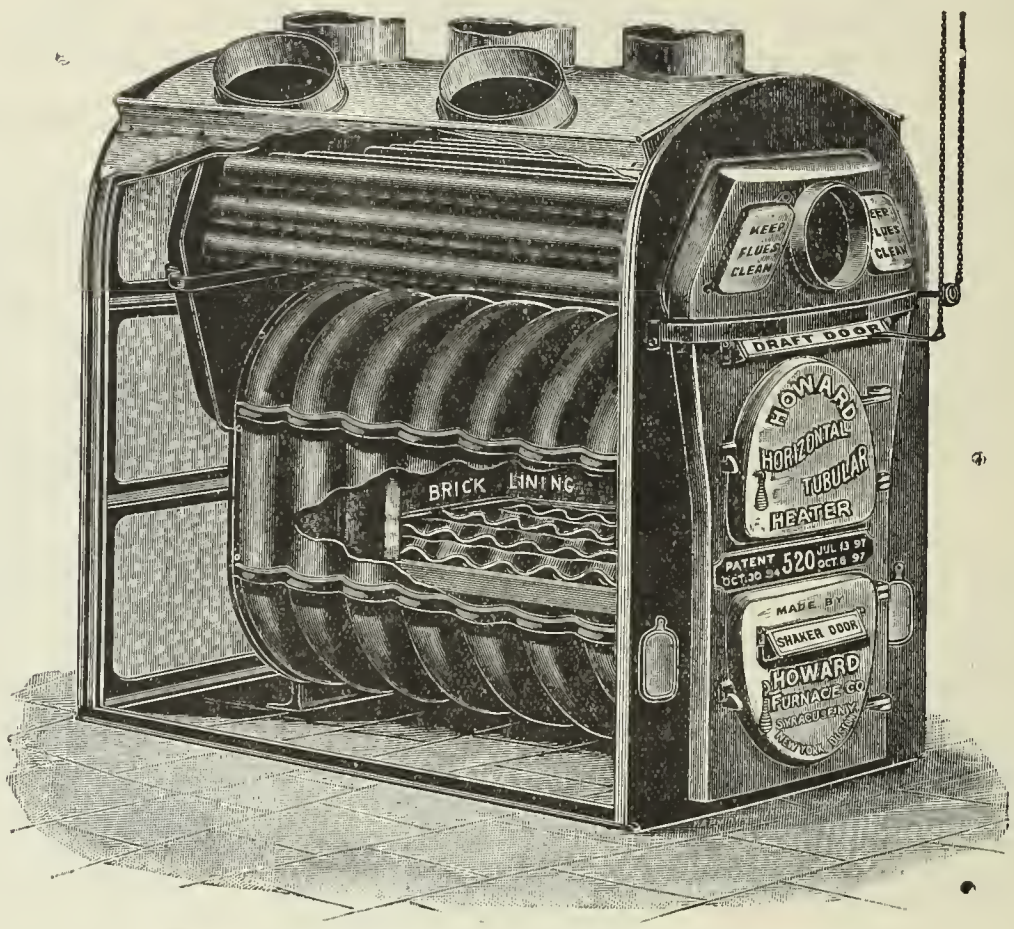
a hot draft

When speaking of a hot draft, we do not mean a hot chimney. We refer to the fundamental principles of properly burning fuel. In order to produce and maintain a good fire an adequate supply of air must be furnished and carried to the fire in a pure state. Then there must be produced an intimate mixture between the inflammable gases before they pass beyond a point where the temperature is insufficient to induce chemical action between the combustible and the supporter of combustion. To do this the air which feeds the fire must be heated. It must be heated to a high temperature.



Patented: Oct. 30, 1894. July 13, 1897. Oct. 5, 1897.

the brick lining

as shown in the cut forms an air space with the sides of the fire box. It is in this air chamber that a hot draft is produced. The air is taken from the ash pit to the fire by passing through this air chamber. The draft is therefore more effectually heated and becomes more rarefied than can be done in any other way. It is heated in the hottest place in the furnace. This hot draft produces another gas (carbon dioxide) that raises the temperature of furnace plate with less fuel.

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THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, November 20, 1897.

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The Business Situation.

At this advanced season of the year it is not natural to look for any very large movement of business. Nevertheless, the current volume of trade, as evidenced by the returns of bank clearings, is seen to be exceptionally heavy. Last week's total clearings were larger than in any preceding week since September 2, amounting to over $1,347,000,000, an increase of 10 per cent. over the preceding week and of 13 per cent. over the second week of November, 1896. This is accounted for largely by the colder weather, which has materially stimulated trade in winter goods, particularly in the West, and by the raising of quarantines against yellow fever in the Southern districts, where traffic is resuming its normal volume. Large orders for goods are being sent out from that section in consequence. These two factors have brought about a healthy movement of merchandise for early delivery, which is keeping manufacturers and merchants busy in many quarters. Otherwise the general business situation shows little change from that outlined a week ago. Local trade in the Eastern and Central States is confined mainly to the filling of current needs, and in some lines is referred to as sluggish. Prices in the main are unchanged. While advances have been few and scarcely worthy of note, recessions, on the other hand, were equally unimportant. Meanwhile, although nothing indicates more than a moderate business during the remaining weeks of 1897, the outlook for trade in 1898 is generally regarded as promising, and manufacturers are preparing for an active spring campaign. Mills and factories at the present time are kept busy filling belated and delayed orders for the winter, and expect to run along on these until orders for spring goods come in. Railway earnings show increasing expansion, amounting for the current month to over 20 per cent. above the figures for this time last year. Last October's aggregated earnings of 132 roads exceeded those of October, 1896, by nearly 9 per cent. The speculative markets have been dull with a narrow volume of dealings and no radical changes in values. Money rates are easier. Loans are offered liberally on attractive terms, but the supply far exceeds the demand. With the reserves of the banks swelling week by week, there is every prospect of continued ease in the money market.

The Paris Exposition of 1900.

Major Moses P. Handy of Chicago, who was appointed by the President as special commissioner to the Paris Exposition of 1900, returned home last week from a sojourn in the French capital with the very satisfactory news that he had been able to secure 200,000 square feet of space for the display of American exhibits. In the Paris Exposition of 1889 this country had only 113,000 square feet, yet made one of the best national displays. Major Handy was somewhat handicapped at first in his efforts to secure adequate space from the fact that the United States was behind all the other great nations in accepting the French Government's invitation to participate, and her representative was in the field nearly a year after the other foreign commissioners. Nevertheless, Major Handy succeeded beyond his expectations in obtaining as large an allotment as was given to any country. From the number and character of the applications for space already filed by American exhibitors, he asserts that no country will be better represented at the Exposition. The only difficulty will be in satisfying the demands of all the would-be exhibitors. The commissioner makes the prediction that the Exposition of 1900 will eclipse anything of the kind in the past, and regards it as an unsurpassed opportunity for the extension of American trade abroad. An office for receiving and filing applications for space and for distributing information regarding the Exposition has been opened at the Bowling Green Building, 11 Broadway, New York, under the charge of Col. L. M. Hamburger, assistant to the special commissioner.

Industrial and Trade Schools in Belgium.

United States Consul Morris, at Ghent, Belgium, reports to the State Department as follows: "Recent official statistics show a considerable increase in the number of industrial and trade schools existing in Belgium. There are 82 in all and 32 apprentice shops. Each of these schools afford the instruction appropriate to its locality—thus, for example, at Charleroi, metallurgy; at Moranwelz, mining; at Soignies, stone cutting; at Ostend, fishing; at Antwerp, maritime construction; at Ghent, weaving; and at Bressage, straw platting is taught. Housekeeping schools and classes number 219. Altogether there are 333 professional, industrial, or trade institutions of instruction in Belgium. The subsidies accorded them by the Government during 1896 amounted to $150,000, while they counted about 7000 pupils."

A new alloy, named Margot's metal, is described as of a purple color, with ruby red reflections. It is a compound of 22 per cent. of gold with 78 per cent of aluminum. It is very beautiful, but is deficient in malleability. Margot, its discoverer, is of opinion that its color is due to microscopic crystals of alumina disseminated in the mass; but this is open to doubt. The yellow alloy of platinum and aluminum can, by a modification of the proportions, be rendered violet or greenish. A rose colored alloy is obtained with 75 parts gold, 200 parts silver and 50 parts copper.

The Philadelphia City Councils have passed an ordinance requiring every engineer and fireman employed in the city to be licensed as a skilled mechanic and to pass an examination before the Municipal Bureau of Boiler Inspection. The ordinance was introduced at the request of the American Order of Steam Engineers, and is designed as a safeguard against incompetent men in charge of boilers.

THE LETTER BOX.

An Overflowing Expansion Tank.

From G. V. H., Lambertville, N. J.—We have a hot water heating plant here that has given the owner considerable trouble from overflowing. Will you kindly tell us through *The Metal Worker* what to do to remedy the trouble? The conditions are as follows: The hot water heater, having a capacity of 700 square feet of radiation, is connected with a system in which there is but 397 square feet of radiation in seven radiators. The expansion tank is placed so that the bottom is only about 6 inches above the highest radiator. It holds about 8 or 10 gallons and has an overflow pipe 4 inches from the top of the tank. It is covered with an ordinary rim lid without any extra vent, depending for vent on the looseness of the fit of the rim of the lid. Once last winter the tank overflowed about 60 gallons. The cover was on the tank at the time and the water ceased to overflow the minute the cover was removed. Under ordinary circumstances I should say it was a case of overheating or boiling over, but there are conflicting ideas as to the condition of the fire at the time the overflow took place. One occupant of the building says the fire was extremely hot at the time, while another says that there was very little fire going. In either case, will you kindly help us out of the trouble by telling us the cause and how to remedy it?

Note.—We shall be glad to have those who have had similar experiences give an account of the trouble and how it was removed, with a view of helping this correspondent. In the meantime we would say that there can be little doubt but that the fire was the cause of the trouble by creating an expansion of the water, and in view of the large heating capacity of the boiler, compared with the surface it has to carry, it is more than likely that steam has been generated and caused the continued overflow reported. Without a sketch of the piping system it is impossible to tell whether or not there are some defects in this that might contribute to the trouble. This part of the system should be carefully gone over, to see that a proper pitch is preserved in the piping throughout and that there are no air traps. In some instances, where a boiler has a greater capacity than is needed, the fire chamber is reduced in size by lining it with fire brick. This reduces the heating power of the fire and also prevents the heat of the fire coming in direct contact with the water heating surfaces. In view of the heating power of the boiler in proportion to the radiation, what might seem a very small fire would be sufficient to generate steam and cause the overflow. The remedy is to so arrange the piping that a connection will be made with the expansion tank above the water line. This pipe should be run so that the system would be relieved through it of any steam generated in the boiler. Occurrences of this kind are not uncommon and are readily overcome by relieving the boiler of steam as soon as it is generated, and thereby preventing the steam from forcing the water out of the system through the pipe to the expansion tank.

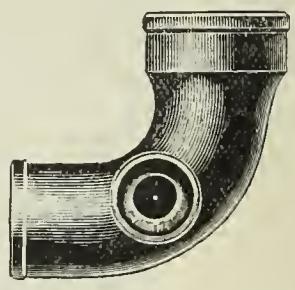
Machinery and the Labor Question.

From L. M., New York.—Please publish in *The Metal Worker* your opinion regarding the statement, "Resolved, That inventions in machinery are desirable." If you can give any reason why they are not desirable they will be greatly appreciated.

Note.—Our correspondent has asked a very wide reaching question and we should hesitate to enter into a discussion of the effect of machinery on modern industrial life. It is not, strictly speaking, an unending argument, but it is one that can be so long drawn out that *The Metal Worker* would have to devote all its pages to a presentation of the two sides of the question. We think our correspondent's wishes will be better met by referring him to an article in the *North American Review* for October, 1897, entitled "Man and the Machine," and written by Bishop Henry C. Potter. The article will furnish what our correspondent wishes—some of the arguments against machinery— and, furthermore, it contains many references to other articles and books on the subject which our correspondent may consult if he wishes to instruct himself on this subject.

Right or Left Fittings.

From M. A. W., Hudson, N. Y.—Will you kindly advise me if there is any rule for determining whether soil pipe fittings, such as elbows, sanitary T-Y's and Y's, having



Right or Left Fittings.—Fig 1.—*A Left Hand Quarter Bend.*

a side connection are right or left hand? This knowledge will enable me to avoid all errors in ordering goods.

Answer.—In order that our answer may be readily understood we have reproduced from the catalogue of Peck Bros. & Co., in Fig. 1, a quarter bend with a side connection; in Fig. 2 a T-Y with a side connection and in Fig. 3 a Y, with a side connection. On interviewing a number of the plumbing supply houses as to their custom of determining

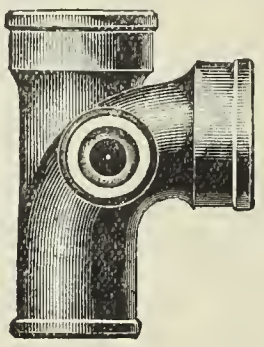


Fig. 2.—*A Right Hand* T-Y.

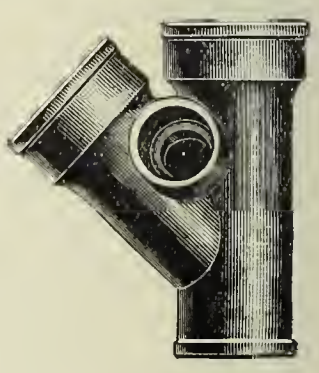


Fig. 3.—*A Left Hand* Y.

whether such fittings are right or left hand, we find that it is the custom to look into the hub end of the fitting and in the direction which the water flows through the main pipe, with the main branch into the fitting held on the side away from the person who is holding it. Then if the side connection is on the left hand side it is a left hand fitting and if on the right hand side it is a right hand fitting. The quarter bend shown in Fig. 1 is a left hand fitting, the fitting shown in Fig. 2 is a right hand fitting, while the fitting shown in Fig. 3 is a left hand fitting.

Plumbing Regulations.

From H. K., Philadelphia, Pa.—Can *The Metal Worker* inform me whether there is a book published giving the regulations and laws for plumbers, and if there is a difference between the laws of different States.

Answer.—We know of no book published giving the laws of the different States. The last report of the National Association of Master Plumbers includes the laws of several different States, and all of these laws differ in some respect. Our correspondent can probably secure the laws of any particular State he desires by addressing the Secretary of State, and by addressing the Board of Health or City Clerk of any city it is quite probable he can secure a copy of the ordinances which have been passed to regulate the examination of plumbers and the supervision of plumbing work.

Heating a Closed Room.

From M. W., Little Falls, N. J.—Will you or some of your readers tell me how to heat a room 12 feet long, 7 feet wide and 12 feet high to about 280 degrees with steam? The room has no windows and is as nearly air tight as it can possibly be made, being lined with asbestos paper. There is floor room for two 1-inch ten-pipe coils, the extra space being taken up with trucks upon which a substance like dough is to be dried. This dough is to be dried quickly, and when the work is properly done it will be crisp and break like glass. The boiler is about 60 feet from these coils and carries about 45 pounds of steam. I have four coils in the room now, each containing about 140 running feet of 1-inch pipe, the coils being supplied from the boiler with 1¼-inch pipe, and returns are 1-inch pipe. The coils will heat the room to 180 degrees, but will not do the work required of them. The boiler is only tapped for 1¼-inch and that is the reason that size main is used in the coil. The inside coils may be made of larger pipe, but I prefer to leave the coils now in and put other ones above them if necessary and over the ones on the floor. If you can change the plan any so it will supply the necessary 280 degrees of heat with the same amount of pipe or by adding more pipe to it, or suggest any other way of getting out of the trouble, I will be very thankful to you.

Answer.—The trouble of our correspondent lies almost entirely with the boiler pressure. Experience with japanning and vulcanizing ovens has shown that it is impossible to obtain 280 degrees temperature in a working oven with 45 pounds boiler pressure. The temperature of the steam in the boiler at 45 pounds is 292 degrees F.—only 12 degrees above the required temperature in the oven. The room as described contains 504 cubic feet of space, with coils equal to 560 feet of 1-inch pipe, or 187 square feet of heating surface. This is equal to 1 square foot of heating surface to 2.7 cubic feet of space, which, with the boiler 60 feet away and no statement as to the amount and quality of felting on the steam pipe, shows as efficient heating power in the dry room as may be expected under the present arrangement.

We can only advise increasing the amount of pipe in the oven as much as can be conveniently accommodated—say 200 to 300 feet of 1-inch pipe—put in a larger steam pipe, say 1½-inch, and felt all the steam pipe and connections from the boiler to the room with thick magnesia felting. Then raise the pressure in the boiler as high as safety will permit, say to 75 pounds or more.

Boilers for the temperature and purpose that you require usually carry from 100 to 110 pounds pressure. In order to properly dry a moist or wet material that is in masses that allows of the surface becoming dry and thus retarding the escape of moisture from the interior, the most approved management has been to close the room tightly at first and until such time that the whole mass has reached the temperature of boiling water, when the room becomes saturated with vapor and the surface of the material is moist and allows a free passage of the vapor from within. Then ventilate slowly to get rid of the vapor, and when the vapor ceases to escape at the ventilator a closure will raise the heat to the highest temperature required for perfect dryness.

Starting a Tin and Cornice Shop.

From J. K., Indiana.—I would like to learn through *The Metal Worker* what tools a man must or ought to have to start a tin and galvanized iron cornice shop.

Answer.—The tools required for a sheet metal cornice shop would be as follows: Cornice brake, 7 or 8 feet long; small brake, 3 feet long; brace bender, brace cutter and puncher, square head, hatchet stake, mandrel stake, blow horn stake, squaring shears, 30 inch or 36 inch; pipe roller, 36 inch length; vise, round headed stake, small turning machine, raising and stretching hammers of various sizes, block for raising, made of lead 12 x 12 x 3 inches; various sizes of hollow punches, and if large work was undertaken in circular work a curved molding machine, and beading machine for beading eave troughs. The tools required for a tin shop doing tin roofing, &c., would be a tin notcher, edger for flat seam roofing, edger for standing seam roofing, hand seamers, and for tin shop work a groover, crimper and swedging machines, hand groovers, soldering coppers, file, mallet, prick punches, rivet punches, rivet sets, scratchawls, compass, plyers, scraper, chisel, hammers, right and left and circular shears and stock shears.

For laying out details for cornice work there would be required one drawing board, about 4 x 6 feet; one small board, 2 x 3 feet, T squares to match; triangles of 33, 45 and 60 degrees, No. 4 pencils and set of drawing instruments. Other tools may be required according to the nature of the work in hand, but these can be obtained when wanted.

Water Leaves the Gauge Glass.

From A. T. E., Ottawa, Kan.—There is a steam job here of the two-pipe type, in which when the steam gauge shows a pound or more of steam the water disappears from the glass gauge. The check valve in the return is in good order. Any suggestions as to the cause and remedy would be appreciated.

Note.—We shall be glad to have our readers give their views on this subject. Without a sketch of the piping it is difficult to locate the trouble and we can only deal with it in a general way. If the steam main is smaller than should be used with the radiation connected to it there is a probability that condensation in the radiators will take place quickly and have a tendency to disturb the water line in the boiler. Another cause of this disturbance would be the failure of the air valves on the radiators to operate, so that when steam in the radiators condensed they would not allow air to come into the radiators to fill the space, consequently the tendency to vacuum would be sufficient to affect the water line. The connections between the glass and the boiler should be examined to see that they are perfectly clear and it is better to have them ¾ or 1 inch in size.

Patterns for Cold Air Box.

From F. V.—I wish you would explain through *The Metal Worker* how to lay out the elbows shown in the sketch, the work being for a furnace cold air box.

Note.—The sketches of plan and elevation sent us by our correspondent show a cold air box of rectangular section, rising vertically from the cellar floor near the furnace, then running upward and diagonally to the cellar ceiling, then turning again and running horizontal and parallel with the connection in the cellar floor. This is quite an elaborate problem, and if our correspondent will refer to *The Metal Worker* of July 14, 1894, he will find the solution of a very similar problem, the only difference being that the pipe first runs horizontally from the furnace. By consulting problem 99 in "The New Metal Worker Pattern Book" he will also find the solution reprinted from *The Metal Worker*, together with another solution of the same problem, while problem 100 treats still another, under similar conditions, by a third solution.

HEATING AND PLUMBING.

New Jersey Master Plumbers' Convention.

The first semi-annual convention of the New Jersey State Association of Master Plumbers was held in Helvetia Hall, Paterson, N. J., on Wednesday, November 17, and was opened by the president, John Hickman. After appointing Ira Budd sergeant-at-arms and S. A. Walker, M. Moran and P. J. Brady a Committee on Credentials, the chairman made an address of welcome. He called special attention tc the importance of the plumbers throughout the State using their influence to secure the passage of a State plumbing law. Among those present were:

G. M. Sinclair, E. Tietje, C. Bach, A. Pflugh and Geo. Vinton from Hoboken.

E. E. Moore, J. J. Kielt, T. F. Kelleher, Thomas F. Heatherton, J. S. Donnelly, M. Moran and John Anderson from Jersey City.

Wm. Devlin, P. J. Brady, J. J. Devaney and P. Flanagan from Bayonne.

National State Vice-President Winslow Zeliff, Elias Berla, C. Sullivan, E. A. Bleything, Ira Budd, Wm. Jacobi, R. Berla, N. J. Steiner, F. J. Sturn, C. E Harrison, C. P. Zimmerman, J. Sutcliffe, Wm. Mooney, W. Hulley, H. Knott, J. Gries, E. E. Joice, S. A. Walker, F. Hasselmeyer, E. Becker, Wm. Virtue, J. P. Zitner, R. Kreitler, R. Groeman and J. S. McDonald from Newark.

John Hickman, John Campbell, A. J. Fielding, John Baker, James McNabb, James Kearney, B. J. Rogiers, R. Beaumont, Levi McBride and J. Quinn from Paterson.

Plumbing Inspector W. H. MacDonald and Secretary of the Board of Health J. P. McNair of Paterson were also present.

The secretary's report showed an increase in membership and a balance in the treasury. A motion was then passed for a retaliatory action to be taken by the plumbers against hardware dealers who sell plumbing goods at cost, the plumbers to retaliate by selling hardware goods at cost.

The following resolutions were then adopted:

Resolved, That the trade schools of the United States do not enroll students at the plumbing trade unless they have served at least one year at the trade.

Resolved, That the term of apprenticeship in this State shall be six years and that the State officials use their influence with the National Association of Master Plumbers to have this term adopted for the United States.

A telegram was received from Thomas P. Culloton, president of the National Association of Master Plumbers, requesting the president to impress upon the members the importance of dealing strictly in accordance with the "Baltimore Resolutions."

The president appointed the following Legislative Committee, the first three of which are newly elected members to the New Jersey Legislature:

Thomas F. Kelleher, chairman.

Jacob Rau, Jr.; C. B. Bauman, Ira Budd, S. A. Walker, E. E. Moore and P. J. Brady.

Mr. Kelleher requested the delegates to present their views as to what should be provided in the hoped for law and a general discussion ensued. A motion was passed that the law should require that the Examining Board consist of a master plumber, a journeyman plumber and a member of the Board of Health.

A feature of the convention was the absence of the executive session which has excited so much suspicion in reference to plumbers' gatherings.

The annual meeting will be held in Jersey City May next on a date to be announced by the Executive Committee. The convention then adjourned.

THE SMOKER.

The Master Plumbers' Association of Paterson, N. J., invited their guests to visit their headquarters in the Romaine Building at the close of the convention, and while entertaining them spread a fine collation at Helvetia Hall, to which they were invited to return. An orchestra furnished a musical programme, varied by singers who rendered the songs of the day. At this entertainment the friends of the plumbing trade were cordially received.

Clifford Schlemmer had a word to say for the New York headquarters of the Temple vent fittings at 109 Beekman street.

J. O. Wilson said he was the only man who had all kinds of bathtubs to sell that were made at the plant of his house, and invited inspection at 92 Walker street, New York.

C. S. Graves, from 94 Centre street, New York, said he had American boilers that were an Advance and of a Perfect type, capable of making Florida weather at any season.

Frank Austin represented the A. A. Griffing Iron Company.

J. Watson, Jr., McNabb & Harlin Mfg. Company.

B. S. Kelly, F. N. Dubois.

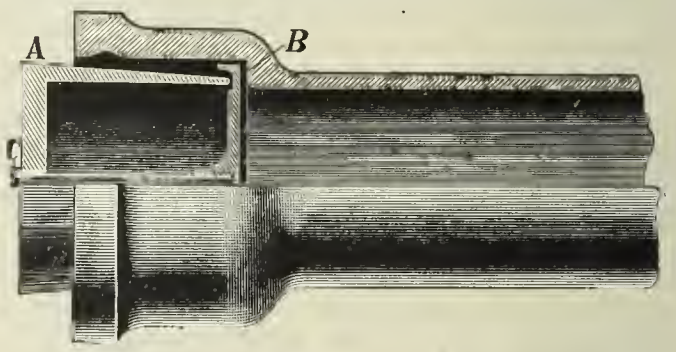
M. T. Gorman, Henry Huber Company.

I. G. James, Gurney Heater Mfg. Company.

A. Devoe, Thatcher Furnace Company.

Streeter's Pipe Plug.

In the accompanying illustrations we show a new plug for stopping cast iron service pipes, which is being put on



Streeter's Pipe Plug —Fig. 1.—Showing Plug in Pipe.

the market by D. A. Streeter of Waterbury, Conn. In laying large cast iron pipes it is often desirable to test them before the work is entirely completed, particularly

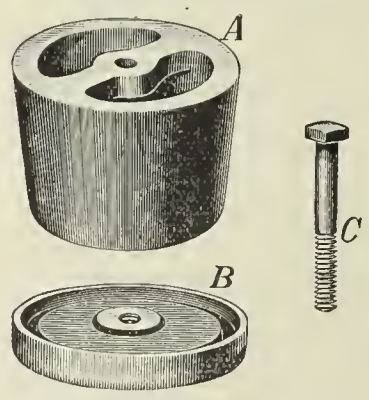


Fig. 2.—The Parts of the Plug.

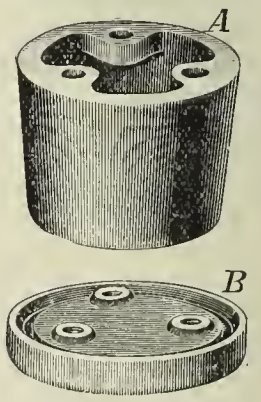


Fig. 3.—The Parts for Large Plugs.

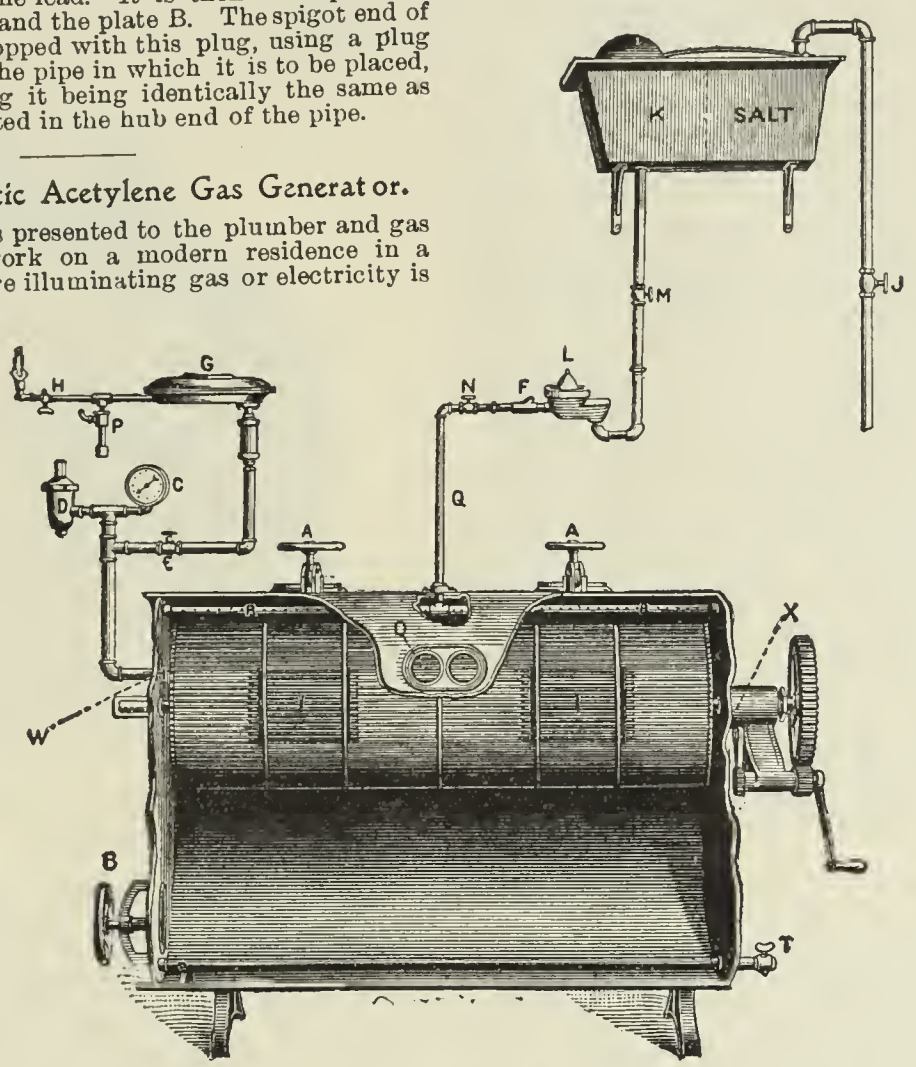
when they are water service pipes in the street and below the surface, so that they must be covered. Fig. 1 shows a section of pipe with the plug in position. The plug is

made in three parts, as shown in Fig. 2, being composed of a shell, A, a plate, B, and a bolt, C, for holding in position. Fig. 3 shows the design of the plug for larger pipes, in which three bolts are used to hold the shell and plate together. In use the plate is inserted into the hub of the pipe and the shell secured to it by means of the bolt. The plug is then ready to be calked either with oakum or with fire clay, after which melted lead can be poured in and a calked joint made in the usual manner. After the test is over and it is desired to remove the plug it can be done by releasing the nut from the bolt, when the shell can be easily knocked out of the lead. It is then a simple matter to remove the lead and the plate B. The spigot end of the pipe can also be stopped with this plug, using a plug one size smaller than the pipe in which it is to be placed, the method of securing it being identically the same as when the plug is inserted in the hub end of the pipe.

Napheys Automatic Acetylene Gas Generator.

One of the problems presented to the plumber and gas fitter who is doing work on a modern residence in a suburban district where illuminating gas or electricity is not available is to satisfactorily light the building. One of the latest devices for this purpose is Napheys automatic acetylene gas generator, for which J. B. Colt & Co., 115-117 Nassau street, New York City, are exclusive agents. Acetylene gas is generated through the union of carbide of calcium and water. Carbide of calcium has been found to have a remarkable affinity for water, and on their uniting the gas known as acetylene is generated. If the water and the carbide, as it is familiarly known, and the gas are left in the same receptacle the generation may continue until considerable pressure is developed, but if after the gas is generated both the water and the carbide are removed, or the water alone is removed, no further generation will take place and consequently no pressure can be developed which might cause trouble. The experience of those who have been investigating the use of this material with a view of producing machines has been unanimous on this point. In the construction of the automatic acetylene gas generator, a broken view of which is shown in Fig. 1, the amount of water which is brought in contact with the carbide of calcium is governed by the pressure generated in the machine. The latter consists of an outer tank in which is suspended on a shaft a cylindrical wire cage with doors, I I, in one side through which the carbide of calcium may be placed after passing through the ports A. The water to induce the generation of gas enters the cylinder and is sprayed upon the carbide through a perforated pipe, R, so that instead of the carbide coming in contact with a large quantity of water the latter is sprayed on only in sufficient quantity to maintain a pressure controlled by an automatic regulator, G. Immediately on the pressure rising to a fixed point an automatic water regulator, L, shuts off the water supply, so that in turning out the burners all through the house the water that is already in the generator will unite with the carbide and generate a sufficient pressure to shut off the water supply. Then owing to there being no water in the generator it is impossible for a high pressure to be developed.

The crank is attached to the shaft on which the wire cage is supported, so that after the outer surface of the carbide has become calcined the cylinder may be agitated to shake off the outer accumulation and to bring new and fresh surfaces in contact with the moisture in the generator. The frequency with which this must be done depends upon the size of the machine. A heavy glass window, O, is placed on each side of the generator, so that the owner may look into the cylinder and see the condition of the charge of carbide in the cylinder and thus become aware of its need of replenishment. An opening, B, is placed in the bottom of the cylinder through which the refuse may be removed, and it is claimed that in this machine the refuse is comparatively dry and almost free from any disagreeable odor, so that it may be disposed of in the same manner as ashes from the fires in a house.



Napheys Automatic Acetylene Gas Generator.—Fig 1.—Broken View of Generator.

Fig. 2.—An Acetylene Gas Burner.

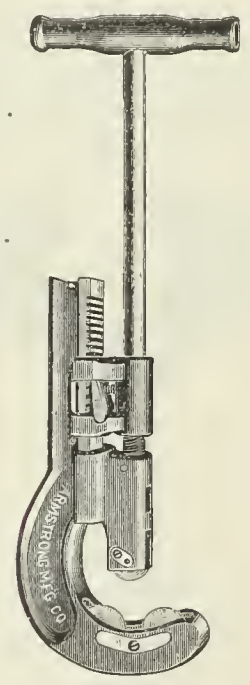
On being generated the gas passes to the house mains through the pipe W, on which a safety valve, D, and a pressure indicator, C, are placed. There is also a stop cock to shut off the gas. Beyond the stop cock is a pressure regulator, G, and an additional mercury blow off valve for further safety. It is explained that both safety valves should be piped to blow off out of doors, so that the escaping gas can do no harm, and that a whistle may be connected to attract attention, so that the cause of the unnecessary pressure can be removed. The water is supplied through an auxiliary tank, which may be

salted, if exposed, to prevent freezing. A check valve, F, is so arranged as to prevent the gas backing into the water supply. Cock T is placed at the bottom of the casing to allow the air to escape when the generator is put in operation. When connected and in operation any gas that may escape is readily detected by the peculiar odor, which closely resembles garlic.

In burning it is necessary to have an especial burner, a very small quantity of acetylene gas furnishing a far brighter light than the ordinary gas light and entirely free from smoke. In Fig. 2 is shown the burner which from experiment has been found to be best adapted for this gas, the latter issuing from two openings and uniting at an angle. By this means it unites with a larger percentage of atmospheric air than would be the case if only one jet was used. The flame is not easily extinguished and the light in many respects has qualities similar to that of bright sunlight, being adapted for use in magic lanterns and for other purposes in which only the arc light or lime light has heretofore been used. In cost to the user it is said that acetylene gas is considerably cheaper than the ordinary gas, and a unit scale, given on circulars prepared by the house, gives a very clear idea of their estimate of its expense in comparison with other methods of illuminating. The machines are made in four sizes, with capacities for operating from 20 to 250 lights. The capacity of the machine is such that on being once charged, when a proper size is selected for a given building, it is unnecessary to recharge the machine for three or four months, so that the care of the machine is simply the turning of the crank of the cage occasionally to bring new surfaces in contact with the water spray. It is claimed by the manufacturers that the construction entirely removes all possibility of danger in the use of carbide of calcium for the generation of illuminating gas, and hence the machine is well adapted for use in all kinds of buildings. They further claim that the cost of the gas and the quality of the light afforded will appeal to those who investigate its merits and make a comparison of its efficiency with other methods of illumination. The company, in addition to circulars fully describing the machine and giving directions for setting it in operation, publish a little pamphlet entitled "Acetylene Gas: Its History and Utilization," by Dr. W. H. Birchmore, who has made a specialty of research in this field.

New No. 3 Armstrong Pipe Cutter.

An improved form of their No. 3 pipe cutter, which is illustrated in the accompanying engraving, is made by the Armstrong Mfg. Company, Bridgeport, Conn. Special claims for this tool are made on account of its strength and rapidity of working, and it is pointed out that it will take a particularly large range of pipe, from 1½ to 4 inches, inclusive. The change from the smallest to the

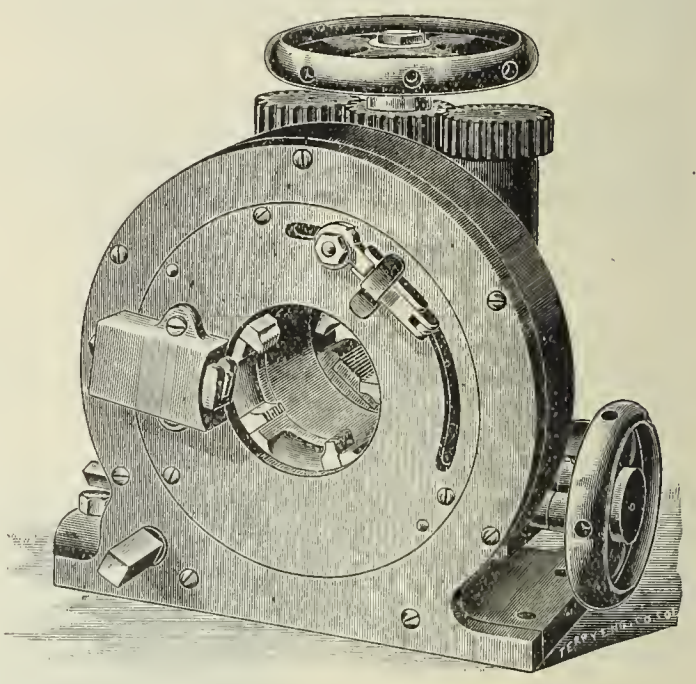


New No. 3 Armstrong Pipe Cutter.

largest size is made by simply raising a pawl and allowing the hooked bar to slide outward. To change to a smaller size the hooked bar is pushed in to the required size, when it is ready to cut. The thread on the handle is only used to follow up the cut as the cutter is revolved about the pipe. This cutter may be changed from a three-wheel to a one-wheel cutter by simply substituting rollers in place of the two cutter wheels at the end of the hooked bar. Full information will be furnished our readers upon application either to the home office of the Armstrong Mfg. Company, at Bridgeport, Conn., or 139 Centre street, New York City.

The Columbus Portable Hand Pipe Threading and Cutting Machine.

The portable hand pipe threading and cutting machines built by the Columbus Machine Company of Columbus, Ohio, have positive quick opening and closing dies, combined universal automatic or hand feed automatically gauged cutting off knife and geared self center-



The Columbus Portable Hand Pipe Threading and Cutting Machine.

ing vise. The frame is integral, and within it the gearing, die head and vise are journaled in perfect alignment. Power is applied by ratchet lever or extensible crank, or by the simultaneous use of two cranks, the side crank being an important feature for cutting off. Worm gear engagement of the die head with a frictionally retained hand wheel shaft gives universal automatic feed or rack and pinion movement at will.

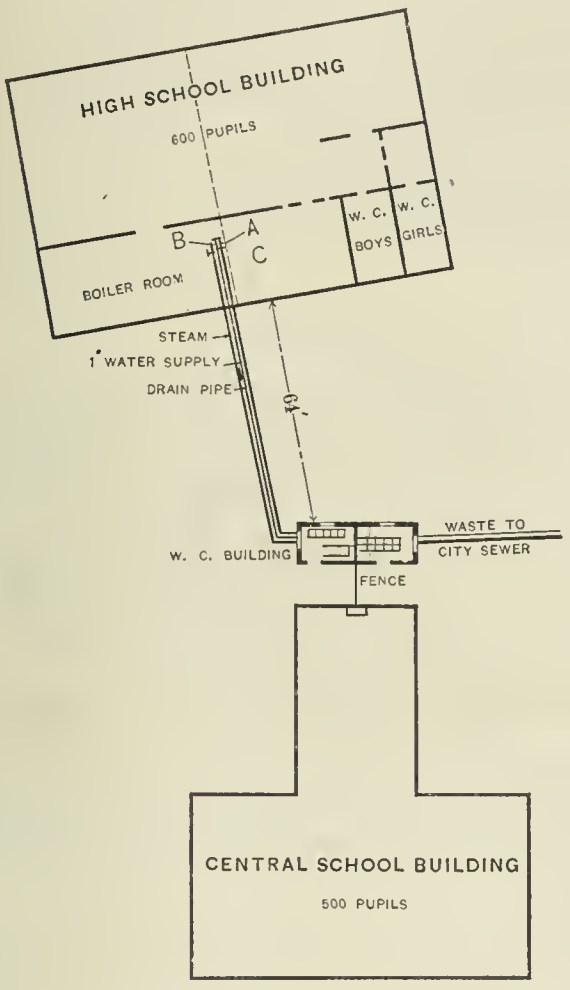
In operation the pipe is held stationary, the die head traversing the space to be threaded. The chasers have cam movement controlled by knee joint lever adjustably secured to permit of graduation to size, and by which the chasers can be instantly opened and positively closed. Five chasers are used to a set, which insures truer threads than sets of less number. They are readily interchangeable and can be resharpened by grinding. The machine illustrated is made in three sizes: No. 2 has two sets of chasers, for threading pipe from 1 to 4 inches; No. 3 has three sets of chasers, for threading pipe from 1 to 6 inches, and No. 4 has three sets of chasers, for threading pipe from 2½ to 8 inches.

A New Illuminant.

The United States Consul, P. D. Duester, writing from Crefeld, under date of October 29, to the State Department, reports upon a new discovery in illuminating as follows: Mr. Ernest Salzenberg, director of the gas works of the city of Crefeld, has invented an improvement in incandescent gas burners, which relates to the production of incandescent gas light, based upon the discovery that when the pressure of the gas is considerably increased upon the incandescence body the said body emits a golden yellow light, very agreeable to the eye, displaying objects in their natural colors. The gas is supplied to the burner at a pressure of about 3½ atmospheres, the burner, to withstand this high pressure, being of special construction. A single incandescent jet of the ordinary size can emit a light of much more than 1000 candlepower. The light is of such intensity that a person is enabled to read the finest print at a distance of 100 to 150 feet. The inventor claims that the cost of his incandescent light of 1500 candle-power is only 4½ cents per hour, while that of the ordinary electric light of 400 candlepower is (in Germany) 14 cents per hour. In the apparatus constructed by Salzenberg a hydraulic pressure of 3.5 atmospheres, and even more, may be forced through the improved Auer burner. The invention is, however, only applicable where water works exist. Mr. Salzenberg has already applied for letters patent in the United States.

SCHOOL HOUSE PLUMBING IN COLD CLIMATES.

In cold climates where the thermometer registers a temperature of several degrees below zero and remains there for several days the designing of a plumbing system that will prove equally satisfactory under such temperatures and also those of summer is a matter of some importance and attended with difficulty. We are enabled, through the courtesy of A. R. Brink, to present an illustrated description of a system to meet all conditions of weather, devised and installed by him in a school house at



School House Plumbing in Cold Climates —Fig. 1.—Plan of School Grounds, Showing Closet Building.

Red Wing, Minn. In Fig. 1 we present a plan of the school house grounds. The original intention was to install the plumbing system in the basement of the central school building, but the objection to the insanitary conditions that might be possible with the best of care disposed of this idea, and a non-freezing system has been put in an outhouse building, located as shown, which has a vault 7 feet deep. At the time the alterations were being made to the school buildings, before the present closet system was installed, the steam heating system was planned for heating all the buildings on the lot and thus enable the use of the basement, which had been intended for the water closet, for other purposes.

The outhouse building is made of brick, with 12-inch wall, and the drawings reproduced here were made to bring the matter before the School Board, and meeting their approval the work has been completed as here described. It has been finished for over a month and the closets have been in use by over 900 pupils, who had been using common newspapers and writing paper in place of the regular toilet paper which the School Board intends to provide, all of which proves the practicability of the system. The feature of the system is the Kenney flushing valve, made by the Kenney Sanitary Mfg. Company, 47 Dey street, New York City. Mr. Brink says in the course of his description: "I wish to state that had not an illustration of this valve appeared in *The Metal Worker* at the time that I was casting about for something adapted for the purpose it would not be in such satisfactory use here now. It was the intention the day that I saw the illustration of the valve and read the description to order some dumping tank to flush the closets, but I decided to inquire as to the adaptability of these valves for my purpose and the result of the correspondence has been their use, so far satisfactory in every respect." Fig. 2 is a plan of the closet building, with the girls' closets separated by a partition wall from the boys' closets and urinals. Fig. 3 is an elevation showing the arrangement of the closet troughs, the flushing valves and the method of draining the entire piping system so as to leave no water in them to freeze.

The building is heated during the hours when school is in session. At the close of school the steam and water to the closets and the building are shut off by means of valves at A, B and C in the boiler room, as shown inFig. 1, the steam, water and drip pipes being run inside of a 15 inch tile pipe packed with mineral wool. When the valve A, in Fig. 3, on the water supply is closed the drip cocks C and B are opened and all the water drains out of the closet building, the steam being shut off at the same time. These water pipes need only be drained in severe cold weather. There is no water at all in the closet vault above the pit or below the floor, except when the flush chain is pulled. The water closet troughs are made of No. 16 galvanized iron, 9 inches deep at the flush end and

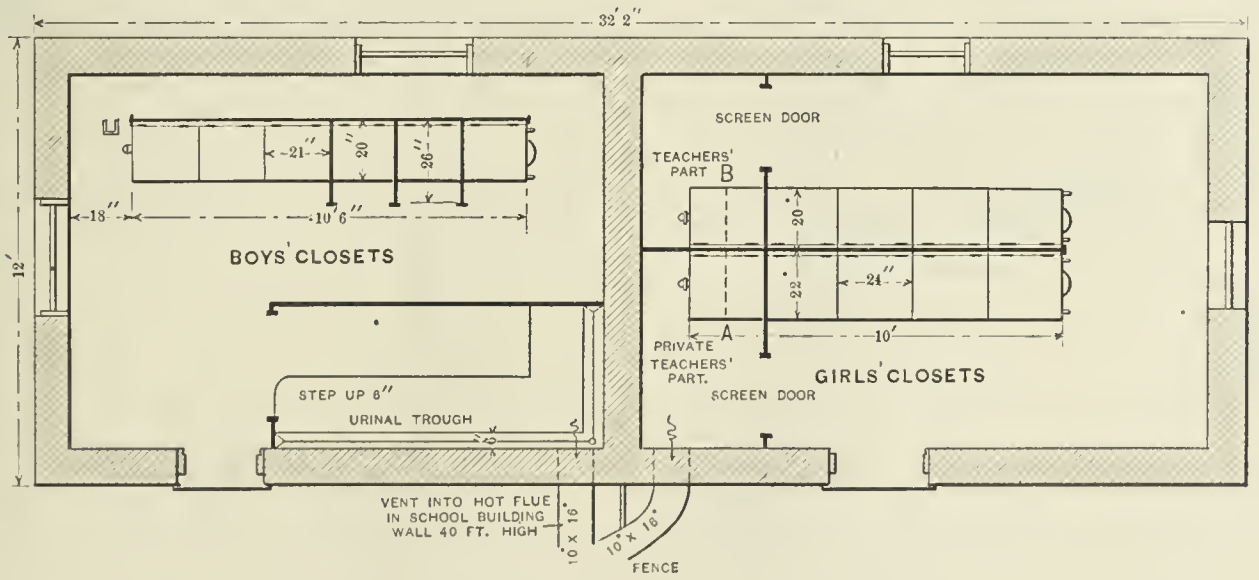


Fig. 2.—Plan of Building, Showing Location of Closets and Urinal.

14 inches deep at the outlet end. They are coated with two coats of pure red lead and boiled linseed oil, after which two coats of enamel paint are applied. There is a water spray the whole length of the trough on each side, as shown in Fig. 4, which is an elevation on the line A B of Fig. 2, the galvanized iron trough being shown under the seats, and up near the seats are perforated copper pipes used for spraying and washing the sides of the

trough. The discharge from the closet troughs is made through 4-inch extra heavy cast iron waste pipe which runs to the sewer, a 4-inch trap being placed between the flushing trough and the sewer, as shown. No vent pipes have been placed on the sewer side of these traps, as is usually done, because there is enough water running after the flush to fill the traps. In case the flush water does siphon from the trap outlets provision has been made for attaching the vents, but after using the closet for a month it has been found that the vents are not needed.

In order to prevent the freezing of the traps they are inclosed in a double brick chamber having a 4-inch air space between the inner and outer walls, both chambers being covered with a wooden cover. The back and trough of the urinal in the boys' closet, an elevation of which is shown in Fig. 5, is made of No. 22 galvanized iron, coated with three coats of enamel paint; also the guard S at the top, which incloses the water spraying pipe. The back is bent up at the bottom, so that there will be no iron that is uncoated exposed to the action of the urine. A step 6 inches high is placed along the urinals, so that those who use it will be as close to the back as possible. The iron back is supported by cleats riveted to it and resting on supports furnished in the wood work. The board B is fastened on the top of the step to the urinal by means of brass screws, so that it can be removed when it becomes worn or saturated. A ½-inch pipe is brought up from the main water service to the top of the urinal back and behind the guard S, where it connects with a perforated pipe which continually washes the surface of the back. The water service from the street is connected with the two Kenney valves, as shown, and with the urinal spray and the seat spray, located as shown in Fig. 4.

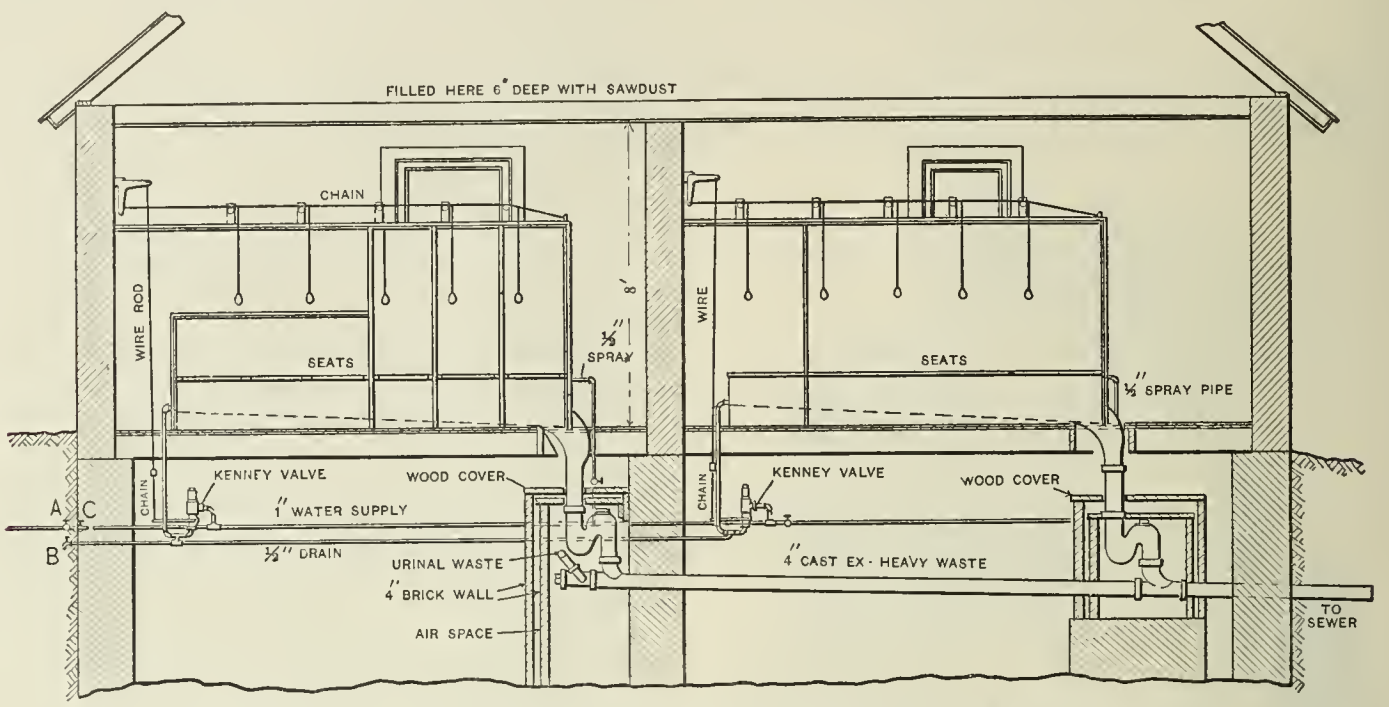


Fig. 3.—Elevation, Showing Flush Troughs, Valves, Trap Chambers and Method of Draining.

The water service carries a pressure of 90 pounds and the Kenney valves are regulated to operate under this pressure. The levers operating the valves are connected by means of cranks with a shaft on which arms are provided, so that the valves can be operated from any closet, chain pulls being connected with the crank arms for this purpose. It will be seen from this arrangement, shown in Fig. 3, that below the floor line of the closet room is an air space in which the valves are located, and that except when the valve lever is operated there is no water in the

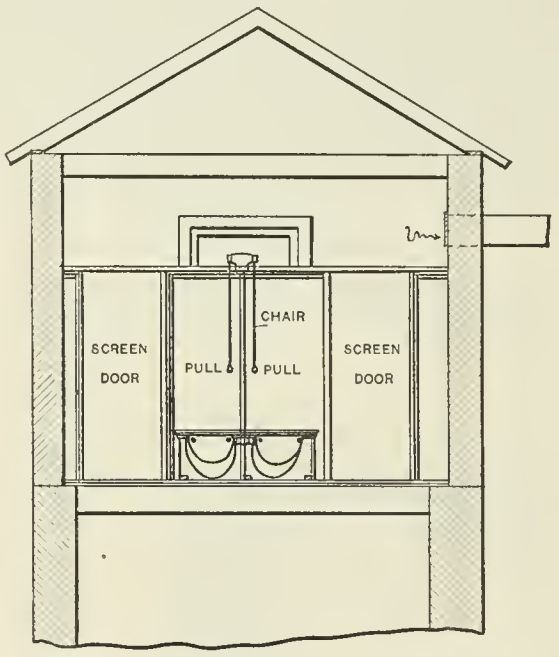


Fig. 4 —Elevation on Line A B Fig. 2.

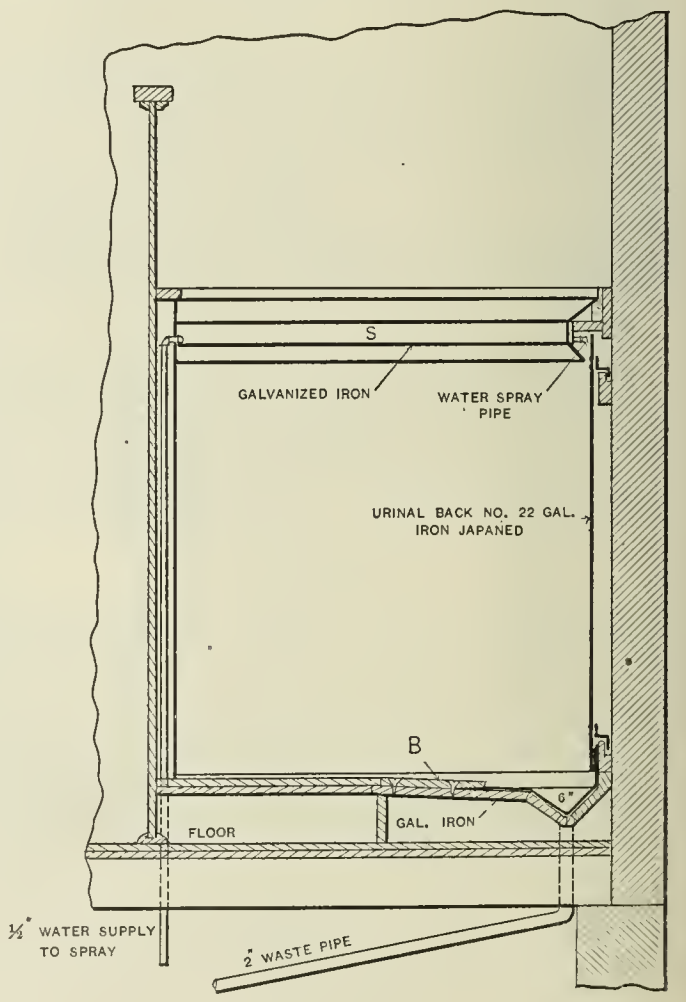


Fig. 5 —Sectional Elevation of Urinals.

valves or the piping to the closet, all being drained off by the pipe B as soon as the valves close. The valves being located below the surface of the ground in a comparatively warm chamber, and as there is no water in them, there is nothing to freeze, but in ordinarily cold weather there will be no danger from freezing even if not drained. All provision is made, however, so that when the janitor makes his rounds of the school building after school is dismissed in the afternoon it is a simple matter for him to manipulate the valves so that every drop of water will be drained out of the system at the same time that he shuts off the steam. The local vent for each of the closet rooms is connected with a large vent flue which is located at the back of the central school building. This flue is used only for ventilating these closet rooms and is warmed with steam pipes from the mains which supply the school buildings.

NOTES.

In response to a call from the master plumbers and master steam fitters in the district comprised in Greater New York there was a large attendance of manufacturers of plumbing and steam goods at the Hotel Windsor, New York, on Thursday afternoon, November 18. As the result of a proposition made for better trade protection there will be a meeting of manufacturers next week and a further conference for the purpose of finally adjusting matters at a later date.

Thomas J. Rice has recently opened a store at 538 State street, New Haven, Conn., and is prepared to execute high grade sanitary plumbing. Mr. Rice has had considerable experience in the business and has worked for the past seven years with Daniel M. Sheehan.

The contracts for the plumbing and heating in the new building of the Milford Land & Cottage Company, on Center street, have been awarded to Disley & Weyand, Waterbury, Conn., the New England Engineering Company having the electrical work.

The plant of H. R. Barker Mfg. Company, Lowell, Mass., was visited by fire on November 12. The building was not badly damaged, but a considerable loss on the stock was sustained, amounting to about $10,000, fully covered by insurance. Rats and matches are given as the cause of the fire.

Some considerable orders for Iron and Brass Fittings for steam purposes have recently been received in New York from Japan.

An inspection of the plumbing fixtures made by the Dalton-Ingersoll Company, 169-175 High street, Boston, Mass., reveals the care taken by the company in the manufacture of these appliances and the originality and inventive talent that has been displayed in modifications to increase their efficiency. In the line of closets they offer to the trade there are a number of special features that will appeal to the progressive plumber. One style of high grade closet is made with a combined flush and vent rim, the exhaust being drawn from the entire circumference of the bowl and carried to the ventilating stack at the back through a wide free channel which secures the thorough removal of the air in and around the closet. Another efficient modification of a closet bowl introduced by this concern is a small rib on the front of the inside of the bowl which equalizes the flush and secures the complete emptying and scouring of the bowl.

Prof. S. H. Woodbridge of the Massachusetts Institute of Technology is in Washington by request of the House Committee on Ventilation and Acoustics to prepare plans for ventilating the Hall of Representatives. It will take ten days or more to make a study of the situation and prepare plans, which will be submitted to Congress, and if approved the work of carrying them out will be under taken during the recess next summer.

We have received from the Judson A. Goodrich Company, 120 Beekman street, New York, a circular of their Climax Automatic Air Valves, which is marked Advance Circular No. 1, and also bears their trade mark, which is a globe suspended over a bowl with steam jets pouring out from opposite sides to keep the globe in motion. The company make a specialty of high grade steam specialties, and two pages are devoted to the Climax Valve, recently illustrated in *The Metal Worker*. The last page shows a number of Compression Radiator Air Valves which are designed to be operated either by a wood wheel or a key in places where it is desirable to prevent the manipulation of the Air Valves by occupants of a building.

The master plumbers of Norfolk, Va., held a meeting at the Atlantic Hotel last week and organized for the purpose of mutual protection. The meeting was presided over by James F. Traynor of Wilmington, Del. The following officers were elected: E. L. Guy, president; Robert F. Lawler, secretary; Thomas J. Carey, treasurer; Thomas J. O'Connor, sergeant-at-arms.

James Dicks has entered into partnership with Charles Gensley in the plumbing business at Newark, Ohio, and the firm will hereafter be known as Gensley & Dicks.

Samuel Dusaume, for many years with Cyrus Spaulding, will start in the tinning and plumbing business for himself, with a shop on Prospect street, Webster, Mass.

Bennett & Hammer, Great Barrington, Mass., have the contract for the steam heating plant in the Berkshire Inn annex.

The Salem, Mass., Board of Health held a meeting and accepted the resignation of John H. Chambers, Inspector of Plumbing. Lawrence E. Millea was elected Inspector *pro tem.*

Edward Rudderow of the late firm of A. L. & Edward Rudderow has started in the plumbing business for himself on Centre street, Camden, N. J.

D. A. Dunbar, Visalia, Cal., is building a workshop in the rear of his hardware store for his increasing plumbing business.

The D. M. Quay Company of Chicago and New York have secured the contract for the plumbing and drainage system for the new Chamber of Commerce Building at Cleveland, Ohio.

The Wolfe Ventilating & Heating Company of Boston, Mass., have been awarded the contract for heating the new Grammar School Building at Southbridge.

Birney & Cross have erected a fine new building for their plumbing business at Chester, Pa.

The Governor of the State of Indiana is giving his attention to the waste of natural gas in various places where it is used throughout the State, and steps will be taken to prevent the loss. Complaints have been filed with the Governor from various sections that the waste has been sufficient to supply the State with all the gas it could use for a year.

We have received from F. Wild, secretary of the Association of Master Plumbers of El Paso, Texas, copies of letters prepared by the association for use before the City Council, who recently interposed some opposition to an ordinance for the regulation of plumbing. The objects of their association and the benefits which have attended the adoption and enforcement of ordinances regulating plumbing are presented in a masterly manner.

A recent issue of the *Gazette* of Geneva, N. Y., shows a picture of the Vance Steam Heater, made by the Vance Boiler Works, Geneva, N. Y., and exploits the merits of the heater and also presents a testimonial letter from a hotel keeper, who states that he consumes 90 pounds of range coal in 24 hours for heating 600 feet of radiation in 17 rooms of the house, without having the gauge register a pound of steam.

The Leavitt Machine Company of Orange, Mass., have opened an office at 54 John street, New York, under the management of Carl W. Hunt, who will look after the interests of the Morse & Dexter valve reseating specialties in this vicinity. These machines enable the possessor to repair leaky valves with very little expense, and will prove a money saving appliance in the workshop of all large steam heating concerns, and also of heating contractors who do repair work.

We learn from M. A. Foote, 54 John street, the New York office of the Powers Regulating Company of Chicago, that their system of temperature regulation has been adopted for the Post Office Building at Omaha, Neb. The system will cost $3500 and is an evidence that among engineers the value of temperature regulating systems is being recognized.

H. W. Littell is now representing Miller & Coates, 279 Pearl street, New York, among the plumbing trade, presenting the merits of their line of plumbing specialties.

T. Holland of the Holland Radiator Company of Chicago was a visitor among the heating trade in New York this week. On his return his son E. Holland will join him and again be interested in the sale of Steam and Hot Water Radiators.

P. J. Baker, 273 Pearl street, manager of the New York office of the Watertown Brass Mfg. Company of Watertown, N. Y., in addition to the various specialties in brass goods made by the company, is showing Enameled Cast Iron Bathtubs, made by the Derwent Foundry Company, Ellwood City, Pa., and by the Victor Mfg. Company of Pittsburgh, Pa. One of the Victor Tubs is adapted to the small bathrooms of apartment houses, being quite short and wide, and is said to be very popular with the users.

We are advised by Herm. Weissenburger & Co., Cannstatt, Germany, that arrangements are being made in Cannstatt for an exhibition of everything relating to acetylene gas. It is proposed to show all the different forms of Generators, Lamps, &c., and we understand that the exhibition promises to be well patronized by manufacturers and consumers.

We have received from Henry C. Weeden, 427-445 Commercial street, Boston, Mass., a programme of the entertainment he proposes to furnish for his patrons on the anniversary of the opening of his warerooms of plumbing goods, which are claimed to be the largest in New England, which will take place on February 1, 1898. A feature of the entertainment will be the distribution of 13 fine paintings, some by old masters, among those of his patrons who have dealt with him from November 1, 1897, to February 1, 1898, and who on that occasion will be invited guests. These paintings are now on exhibition in his showrooms, and in addition there is a "mysterious painting" which shows clearly that it is of great age, and some art critics have suggested that it was painted by Rubens. The owner, who is desirous of finding out if it is a genuine Rubens, has decided to exhibit it throughout the United States, and offers $1000 in cash to any one who can tell what the subject of the painting is and identify and prove it to have been painted by Peter Paul Rubens. By exhibiting it Mr. Weeden gives his patrons an opportunity to win this prize. The other paintings on exhibition will be distributed among the guests by a method to be determined by Mr. Weeden.

We understand that the recent explosion of a steam heating boiler at Waltham, Mass., was due to the weighting down of the safety valve to keep it from blowing off. The boiler has been replaced by a Doric boiler.

C. P. Quigley, formerly in the service of John Funkey, Sr., has started in the plumbing business for himself at Hancock, Mich.

Kinnear & Co. have bought out the plumbing establishment of John Dixon on North Court street, Rockford, Ill., and moved it to South Court street.

The Standard Steam Specialty Company is a new house at 83 Centre street, New York, that has purchased from G. I. Roberts the patents and will manufacture the Utility and Midget Pump Governors. They will manufacture Steam Specialties for high and low pressure systems. Herbert A. Joslin, who is well known to the trade, is president of the company.

J. R. Weber & Co., successors to W. H. Davis in the wholesale and retail Hardware business in Quakertown, Pa., have enlarged the store and put in new shelving. They have also increased their show window space. They advise us that they will add a plumbing, gas and steam fitting department after January 1 next.

Massachusetts Gas Fitting Law.

Chapter 265 of the acts of the Massachusetts Legislature of 1897 relates to licensing gas fitters and supervising gas fitting in the city of Boston, and is as follows:

Section 1. No person, firm or corporation shall engage in or work at the business of gas fitting in the city of Boston after the first day of October in the year eighteen hundred and ninety-seven, either as employer or as a journeyman, unless such person, firm or corporation has received a license therefor in accordance with the provisions of this act. The word "journeyman," as used in this act, shall be deemed to mean one who personally does any gas fitting, or any work in connection therewith, which would be subject to inspection under the provisions of this act.

Sec. 2. Every person, firm or corporation desiring to engage in the business of gas fitting in the city of Boston shall make application therefor to the building commissioner, and shall, at such time and place as may be designated by the board of examiners hereinafter provided for, to whom such application shall be referred, be examined as to his qualifications for such business.

Sec. 3. The board of examiners shall consist of the building commissioner, the chairman of the board of health, who shall be *ex-officiis* members of said board and serve without compensation, and a third member, to be chosen by the board of health, who shall be a practical gas fitter of at least five years' continued practical experience during the years next preceding the date of appointment. Said third member shall be chosen within thirty days after the passage of this act, for a term ending on the first day of May in the year eighteen hundred and ninety-eight, and thereafter annually; and he shall be allowed a sum not exceeding five dollars for each day of actual service, to be paid from the treasury of the city of Boston.

Sec. 4. Said board of examiners shall, as soon as may be after the appointment of said third member, meet and organize by the selection of a chairman and a clerk, and shall then desginate the times and places for the examination of all applicants desiring to engage in or work at the business of gas fitting in the city of Boston. Said board shall examine said applicants as to their practical knowledge of gas fitting, shall submit the applicant to some satisfactory form of practical test, and, if satisfied of the competency of the applicant, shall so certify to the building commissioner, who shall thereupon issue a license to such applicant, authorizing him to engage in or work at the business of gas fitting, first requiring him to register in the office of said building commissioner his name, place of business or residence, license number, date of examination, and in what capacity licensed. In case of a firm or corporation, the examination of one member of the firm, or of the manager of the corporation, shall satisfy the requirements of this act. The fee for the license of any employing gas fitter shall be two dollars, and for a journeyman, fifty cents; and said license shall continue in force until revoked or canceled, but shall not be transferable.

Sec. 5. The building commissioner shall appoint, after the first day of October in the year eighteen hundred and ninety-seven, such a number of inspectors of gas fitting as the board of examiners may from time to time determine. Said inspectors shall be practical gas fitters of at least five years' continued practical experience, and shall, before appointment, be subject to an examination before the civil service commissioners. The compensation of said inspectors shall be determined by the building commissioner, subject to the approval of the mayor; and such inspectors shall hold office until removed by said commissioner, with the approval of the mayor, for malfeasance, incapacity or neglect of duty. Said inspectors shall inspect all new work relating to gas fitting in new and in old buildings, the connections and use of such work, and shall report all violations of this act or of any act or ordinance relating thereto, which now exists or may be hereafter enacted or ordained; and they shall also perform such other appropriate duties as may be required by the building commissioner.

Sec. 6. Every licensed gas fitter shall display his license number conspicuously at his place of business.

Sec. 7. On and after the first day of October, in the year eighteen hundred and ninety-seven, no building shall be piped or fitted for gas, nor shall any repairs be made in such piping or fittings, nor fixtures placed, unless a permit shall be granted therefor by the building commissioner. Every licensed gas fitter desiring to perform any work relating to piping or fitting a building for gas, or to repair gas piping or fittings, or to place fixtures therein, shall file application therefor at the office of the building commissioner, giving the correct location, name and address of the owner, the intended use and material of the building, and a full and complete statement of the work proposed and material to be used, and shall, if required by said building commissioner, furnish a plan thereof, which shall be subject to his approval. All materials used and work performed under the provisions of this section shall be subject to such regulations as shall be made by the board of health and the building commissioner.

Sec. 8. No gas pipe which may be introduced in any building shall be let into the timbers, beams or girders, unless the same is placed within thirty-six inches of the end of said timber, beam or girder, and in no building shall the said pipes be let into the timbers, beams or girders more than two inches in depth. No person shall disconnect or remove any gas meter, except the duly authorized representative of the gas company owning such meter.

Sec. 9. All gas brackets shall be placed at least three feet below any ceiling or wood work, unless the same is properly protected by a shield, in which case the distance shall not be less than eighteen inches. Nothing in this act shall be construed to affect the operations of any gas company upon its own premises or upon its mains and surface pipes.

Sec. 10. The board of health of said city by its inspectors shall from time to time, as it deems proper, inspect the gas fixtures and appliances in any building, and shall make such requirements relating thereto as it deems the public health requires, and the owner of such building shall comply with such requirements.

Sec. 11. Any person violating any provision of this act shall be deemed guilty of a misdemeanor, and shall be subject to a fine of not exceeding one hundred dollars for each offense, and if such person has received a license under this act his license may be revoked by the building commissioner.

Sec. 12. The building commissioner shall include in his annual report to the city council a report of the proceedings of the building department under this act, and shall include therein a report of the board of examiners appointed under this act, giving their proceedings during the year ending on the first day of February.

Sec. 13. All acts and parts of acts inconsistent herewith are hereby repealed.

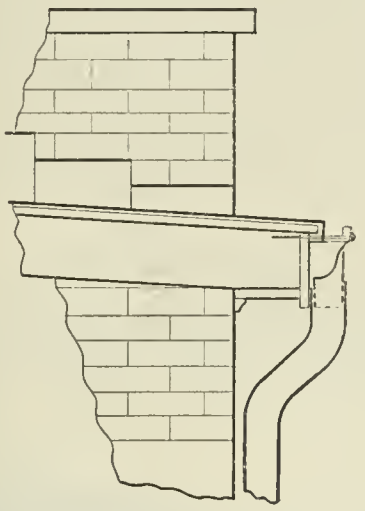
Sec. 14. This act shall take effect upon its passage, except so far as is hereinbefore otherwise provided.

SHEET METAL WORK.

Hints About Roofing.

BY OLIVER TWIST.

Felt and gravel roofing is adapted to great extremes of climate, and is found in successful use from New Orleans to the frozen north; and yet we find, here and there, poor roofs of this kind, just as we find poor tin, slate and galvanized iron roofs. The writer has often met the query, "What is your opinion of a certain kind of roof?" Well, every kind of roofing has its champions, and some possess commendable features not found in others; but, without



Hints About Roofing.—Fig. 1.—Section through Gutter.

discussing the merits or demerits of each, it is clear that to obtain desirable results there must be good materials, good workmanship, and the shape of the roof must be suited to the covering.

If you wish a house roofed with British Columbia shingles, then you would give it a fall of 9 or 12 inches to the foot; if you would have a roof almost flat, then wood and metallic shingles, slates, &c., are out of the question, and something must be chosen whose component parts may be so joined as to form one continuous water tight

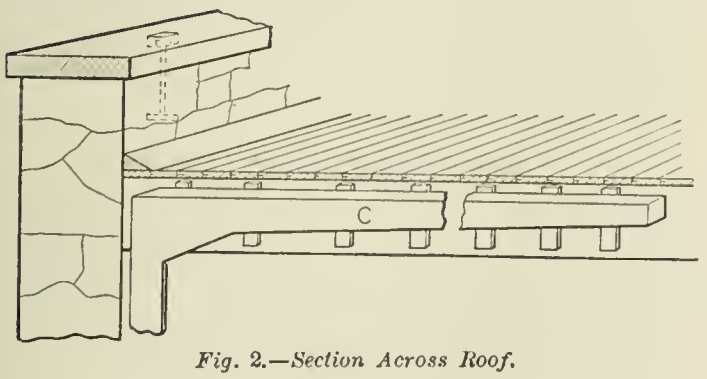


Fig. 2.—Section Across Roof.

piece, not liable to become broken at any seam or any other point through changes of temperature, wind storms, &c. If a client or architect desires a certain shape of roof he must select a material which can in every way conform to that shape with satisfactory results. If he will have a specific material, then the shape must be subservient.

Very good. These are only elementary principles, you say. But apply them to the poor roofs and it will be found that it is in their violation that the trouble began. This man has used rough, undried, unplaned lumber for a basis, when he should have had it with a tongue and groove joint, planed and dry. "It's cheaper, and I don't know that it makes much difference," he says. However, it does make a difference, as he finds later on; more so, perhaps, with some materials than others.

Here again we find one who has invested in a new kind of ready roofing, and the men who are working in the roofing business at that place have had no previous experience with it, or he may think himself capable of doing the work with a little help, as it is said to be easily applied. The roof is steeper than it should be, to begin with, and the felt is lapped 1 inch where it should have 2 or 3 inches, and, being put on with nails and tin washers, it happens occasionally that a few are driven between the joints of the sheathing.

The chimneys and skylight give a little trouble, but by and by the job is complete, but the very next summer it needs fixing. The sun caused the protecting covering of tar and sand or "paint" to run off owing to the excessive amount of fall, and the felt withered up, the top layer "crawled" away from its neighbor, leaks were plentiful, and after being fixed and fixed without avail had to be removed.

Experience has taught that in severe wintry climates (for dwellings, stores, &c., having a flat roof) it is preferable to drain through a conductor pipe placed within the building. Fig. 1 shows the eave of a felt roof, which has a continuous fall from front to rear of building, with an

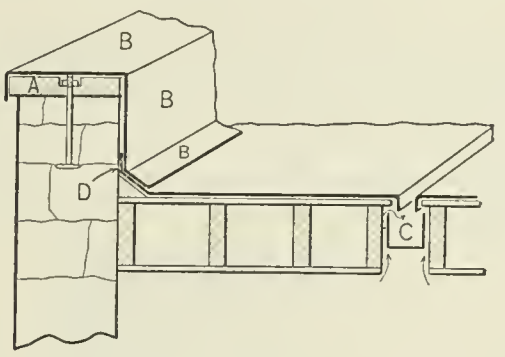


Fig 3.—Showing Finish Around Fire Wa

ogee eave trough spiked to the rafters and a conductor outside of building.

The great trouble with this type is that a ridge of ice will be sure to form along the eaves, which will dam back the water and form a miniature lake. Fig. 2 shows a method which was designed to overcome this. A galvanized trough was made 6 inches wide, extending across the roof more than two thirds of its width, and supported between the joists as in Figs. 2 and 3 by being nailed to wood strips in such a way as to admit a current of warm air from ceiling around the trough and out, as shown by the arrows. The roof has a fall toward the gutter C from both ends equal to $\frac{3}{8}$ inch to the foot. The conductor pipe and trough were by this means kept free from ice throughout the winter.

The finish along a fire wall is often a cause of trouble. In Fig. 3 is shown a stone wall of a building used as an engine house. A hardwood plank 3 inches thick is bolted to the stone work, its inner face flush with wall, its outer edge projecting 2 inches. A triangular strip of wood is placed in the angle of wall and roof, and the felt well secured there with hot pitch. The coping is covered with galvanized iron, extending down the fire wall and over the triangular strip, which thus protects the felt from the direct rays of the sun and throws the water away from the wall. In Fig. 3, A is the wood cap or coping, B the galvanized iron covering, C the trough in section, and D the felt behind the iron.

THE ROOFING SLATE TRADE.

Notwithstanding the settlement of the long strike and a resumption of work some weeks ago, as we reported at the time, at the great Penrhyn quarries in Wales, the movement of American roofing slates to Europe has continued in heavy volume up to the present. This export trade has been of sufficient amount to make up for a comparatively light domestic consumption, and has served to keep available stocks at the quarries unusually low. At the Pennsylvania quarries, unsold stocks of slates, 18-inch and larger, are the smallest in 15 years, while small sizes of sea green and purple at the Vermont quarries are very scarce and the larger varieties of the same by no means plentiful. Bangor slates of the best quality are practically cleaned out, and as most of the quarries there and at Pen Argyl, Pa., will close about January 1 for three months or so the position of these slates is a strong one. At the present time all the American quarries are busy. The outlook for business in the coming year is regarded as favorable. Building operations of the kind where slate roofing is used have been comparatively limited in the past season, but a considerable amount is said to be in prospect for next year, and it is hoped that there will be enough expansion in the domestic consumption to offset the shrinkage in foreign orders which is likely to occur as the available output of Welsh slates increases.

At present the stocks of Welsh roofing slates abroad are very low. In fact, the market in England is almost bare of the domestic material, and the producers are understood to be so well booked up that they are refusing orders for deliveries within six or eight months. French slates, on the other hand, are reported to be accumulating to some extent, and these stocks may find an outlet in the British and other European markets which have favored the American product in the past two years. One thing which may militate against the export trade in American slates is the fact that freight rates from here to European ports are advancing sharply and may reach a level within the next few months which would make it difficult for the American material to compete with the Welsh in the European markets. As it is, the foreign consumers are taking American slates, not so much on account of their preference for them as because they are cheaper in price than the domestic product and are more readily obtainable for immediate use. Exporters of American slates report quite a falling off in orders from Europe for forward deliveries, although the contracts for prompt shipments keep up in good volume. Recent shipments have been made principally to British and German ports, but some good orders have been filled for Australia and South Africa.

Rumor has it that a combination has been formed amoug the Welsh slate producers to shut out the American material from the British market by means of a species of boycott applied to the importing firms. But the extreme scarcity of domestic roofing slates in England stands in the way of effective actiou of the kind at the present time. It is noted that the call from that quarter for American slates is confined almost entirely to the cheaper grades. The better qualities, such as Best Bangor, are too high in price for the foreign consumers. Moreover, a much rougher and poorer kind of slate is generally used for building purposes in the United Kingdom than would be tolerated by builders and owners in this country.

In regard to the Penrhyn quarries, it is reported that there is much dissatisfactiou among the men over the result of the late settlement. They claim to have been deceived in some particulars, and a renewed agitation is said to be on foot which may eventuate in another strike and shut down at Penrhyn. Should this happen, European consumers would again turn to the United States for their supplies of roofing slates, and the export trade would continue heavy for an indefinite time.

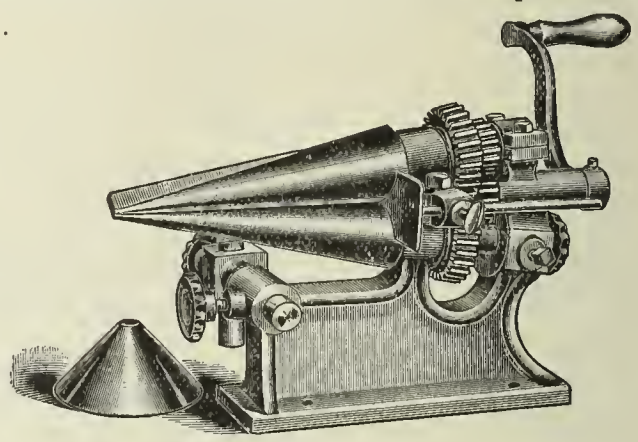
The New York Metal Ceiling Company, Twenty-first street and Thirteenth avenue, New York City, have recently completed the Metal Ceiling in the dining room and office of the Garde Hotel, New Haven; also Metal Ceilings in the Fox and Conroy Buildings, Stamford and the Berlin Savings Bank, and have contracted for Ceilings in the new library building in Winsted, Parker & Davis' store in Bridgeport and the Masonic lodge rooms in Unionville, Conn.

Table for Elbow Patterns.

We are indebted to Thomas Rooney, 239 Caledonia street, Lockport, N. Y., for a copy of his table of altitudes of sheet metal elbow patterns with directions for using the same. The book, which is neatly bound in cloth, is 5 x 8 inches in size, containing 21 pages, and with it is a supplement giving full instructions for the application of the tables. The tables were compiled from a 24-inch chart, made expressly for the work, and by their use the altitudes of the patterus can be obtained and the patterns for all kinds of elbows readily secured. The tables apply to two-piece elbows from 1 to 24 inches in diameter and 1 to 60 degrees of angle ; three-piece elbows from 1 to 24 inches in diameter and 45 to 90 degrees of angle ; four-piece elbows of similar diameters from 55 to 90 degrees of angle ; five-piece elbows of similar sizes from 65 to 90 degrees of angle, and similar tables are likewise presented for six, seven and eight piece elbows. The supplement sketches show how to draw the patterns, and with the book of tables will prove of much interest and value to tinsmiths and sheet iron workers.

Niagara Funnel Former.

The Niagara Stamping & Tool Company of Buffalo, N. Y., manufacturers of sheet metal tools, have put on the market a new machine with cone shaped rolls for



Niagara Funnel Former.

forming conical and taper work of various angles that cannot be produced on ordinary forming rolls, such as funnels, can tops, lamp shades, &c. The work is done in the usual way, by feeding the material between the front rollers, and a third roller does the bending. The third, or forming roll, is adjustable to all positions. The length of the rolls is 10 inches.

The Art Metal Relief Company.

The firm of J. F. Weitzel, Cincinnati, Ohio, manufacturers of galvanized iron and sheet metal specialties, and that of The Art Metal Relief Sign Company, Covington, Ky., have been merged into one concern by reorganization and the incorporation of The Art Metal Relief Company of Covington, Ky., as it will hereafter be known, with a paid up capital of $25,000, with J. F. Weitzel president, John G. Meyer secretary and treasurer and R. K. Kabitzch superintendent. The present plant, located at York and Pike streets, Covington, Ky., will have additional buildings put up at once, and a fine line of tinners' and builders' sheet metal specialties, also art relief work in galvanized iron, zinc or copper of every description, will be produced.

In an item in *The Metal Worker* last week, relating to this incorporation, Mr. Weitzel's name was incorrectly given and the capital stock was wrongly stated to be $5000 instead of $25,000.

James A. Towsen, a prominent citizen of Harrisburg, Pa., died at his residence in that city on November 11, aged 78 years. He was born at Lancaster, Pa., and there learned the trade of slate roofing. In 1867 he established himself in Harrisburg as a slate roofing contractor, joining the firm of Thomas Arnold & Co., and purchasing the whole interest in the firm ten years later. Mr. Towsen

was one of the best known slate roofers in Pennsylvania, receiving large contracts from the Pennsylvania Railroad Company, the Pennsylvania Steel Company and other important corporations, besides carrying out a great deal of work on public buildings. He fought in the Civil War with the Forty-seventh Regiment of Pennsylvania Volunteers, attaining the rank of quartermaster-sergeant.

FLASHINGS.

The master tinners of Memphis, Tenn., are organizing and have applied for a charter. John L. Eichberg, secretary *pro tem.*, 234 Third street, Memphis, Tenn., will be glad to receive from secretaries of similar organizations of master tinners copies of by-laws to assist the Memphis master tinners in drawing up their own.

Rohrbach & Bro., Reading, Pa., have received the contract for the Roofing and Spouting of the Orphans' Home. About 12,000 square feet of Tin will be required.

The Russell Roofing Company have been incorporated at Chicago, with a capital of $5000, by T. J. Thompson, A. E. Buck and W. W. Haight.

A press dispatch from Pen Argyl, Pa., states that the Bangor and Pen Argyl slate region is receiving a visit from English capitalists, who have formed a company to develop the American slate trade in Great Britain and on the Continent of Europe by the importing of slate from the United States. The company will be known as the American Slate Mart & Wharf Company, Limited, of London, England, and will have a capital of $500,000. Samuel Keat of Pen Argyl is named as the sole representative of the company in this country.

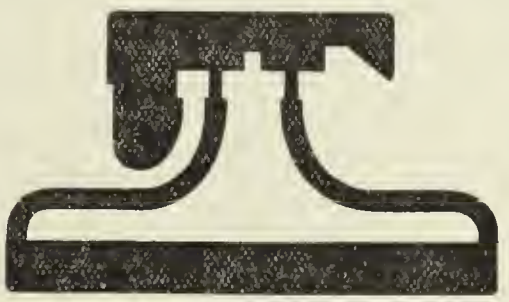
The Spontaneous Combustion of Coal.

In July, 1896, a commission was appointed by the New South Wales Government to inquire into the causes of fire in coal cargoes. In dealing with the general subject the report of the commission summarizes as follows the theory of the spontaneous combustion of coal, which it will be observed ignores the old pyrites and sulphur theory prevalent for so many years :

Coal naturally absorbs oxygen from the air and undergoes a process of slow combustion. As this process goes on heat is developed, and the temperature of the coal tends to rise. The activity with which the oxygen is absorbed increases as the temperature rises. It appears, therefore, that the conditions necessary for the spontaneous heating of coal are: 1, A sufficient supply of oxygen ; 2, prevention of the escape of the heat generated. These two conditions are more or less incompatible. Whether the coal heats or not depends on whether the heat can or cannot escape as fast as it is generated. Since heat passes away more rapidly (other things being equal) the hotter the coal, while the supply of air for promoting combustion is conditioned by other circumstances, it often happens that the temperature of a heap of coal will rise to a certain point, which it will not pass. If a heap of coal is prevented from coming in contact with air, no action will occur and no heat will be developed. On the other hand, if the air supply be so free as to carry away the heat generated at a sufficient rate, again no heating will take place. In order that spontaneous combustion may occur, the supply of air must be nicely regulated. The kind of ventilation which used formerly to be employed with coal cargoes often supplied just the air necessary for spontaneous heating. At low temperatures the absorption of oxyen by coal is a comparatively slow process, and at a given temperature the rate of absorption depends on the ratio of the surface of the coal to its volume. Thus, other things being equal, the smaller the coal the more rapidly will it absorb oxyen. On the other hand, the coal cannot absorb oxyen unless the oxygen is there to be absorbed, and when the coal is in very fine dust the rate at which the air can penetrate the heap is only small. It therefore appears that when the coal is in large pieces it will only absorb oxygen slowly, because of the comparatively restricted area of surface which it exposes ; while if the coal is in very fine powder the air will not be able to penetrate the mass with sufficient freedom. There must, therefore, be a certain size of coal at which the rate of absorption will be a maximum. Such an effect was observed by Fayol, who shows that heaps of small coal mixed with coal dust offer the most favorable conditions for heating. Such heaps are formed under the hatchways of ships which are loaded by dropping the coal from hoppers, spouts or wagons, so that the coal gets broken up during the process. The size of a heap of coal has a great influence on its liability to spontaneous combustion. Thus, Fayol found that the coal of Commentry never took fire by exposure to air when the heaps were less than 2 m. deep, no matter what the lateral dimensions of the heaps might be. It was formerly supposed that the oxidation of pyrites is the initial cause of spontaneous heating. This, however, has been disproved in many test cases by direct experiment, and it also appears that there is no direct relation between the pyrites content of coal and its liability to spontaneous combustion. On the other hand, if coal is wet it has been shown that the pyrites tends to oxidize, and in so doing may help to break up the coal and so render it more liable to spontaneous combustion by increasing the surface. We are now in a position to understand the main features of the phenomena of the spontaneous combustion of coal. Coal always absorbs oxygen from the air, and always generates heat in consequence of the combination of the oxygen with the carbonaceous contents of the coal. The rise of temperature, however, which accompanies this process is dependent on the rate at which oxygen is absorbed, on the one hand, and on the rate at which heat escapes, on the other. Both of these factors may be greatly influenced by comparatively trifling variations in the conditions. The size of the coal, the distribution of coal dust, the initial temperature of the coal, the temperature of the inclosure in which the coal is placed, the size of the heap of coal—all have an effect on the temperature attained. To any one approaching the subject for the first time, the great puzzle is to understand why some cargoes fire and why others escape—all being under conditions which are to the first order identical. After study of the phenomena, however, it easily appears that there must necessarily be a kind of critical temperature. If the coal succeeds in reaching this, then its thermal equilibrium becomes unstable and the temperature rises indefinitely. A very slight difference in the conditions will determine whether this critical temperature, which itself depends on the special circumstances, is attained or not. The puzzle above referred to is, therefore, solved by the remark that when some cargoes fire and others do not, the conditions are not the same in reality, though, roughly speaking, they may appear to be so. The apparently erratic behavior of coal cargoes is therefore just what would be expected, having in view the fact that very slight variations in the circumstances may make all the difference in determining whether the critical temperature will be passed or not.

Points on Core Making.

The Holland Linseed Oil Company, 683 Austin avenue, Chicago, are making a special core oil for foundrymen's use, with which remarkable results are obtained. The accompanying cut shows a very difficult core—namely, a port core for a steam cylinder—made with this oil without venting. The core maker who turned out this core states that none of the small sized cores made with this oil are



Points on Core Making.

vented, but the large ones generally are. The saving of time in making small cores without venting is very considerable and in itself is a strong point, but it is further claimed that still more time can be saved in making cores with the core oil than with flour. These cores are not liable to blow, and are therefore much safer. The company claim that if the right kind of sand is used with their core oil there is no need of ever losing a casting. If there is no combustible matter in the sand, the little that the oil contains escapes in baking. With open sand the core is very porous, and is consequently a magazine for storing gas. After the casting cools these cores crumble very easily, and thus finally save time in their removal.

A committee of the Merchants' Exchange of St. Louis, Mo., are completing plans for the establishment of the proposed line of steel barges between that city and New Orleans, La. It has been found that at least $250,000 will be needed to equip and operate the proposed barge line, and a meeting has been called to initiate active steps toward raising the money and incorporating a company for the purpose. It is thought that the proposed line of steel barges will secure a better outlet for the export products of the St. Louis market than at present exists, and enable that city to meet the competition of other trade centers on more favorable terms.

TIN PLATES.

Industries at New Castle, Pa.

A correspondent of the Pittsburgh *Times*, who recently visited New Castle, Pa., speaks of a number of the larger industries of that place as follows :

New Castle expects to be able to produce one-fifth of the total amount of tin plate now consumed in the United States. And yet New Castle has now the largest tin plate establishment in this country, possibly the largest in the world. This is operated by the New Castle Steel & Tin Plate Company, has 20 hot mills and 21 cold mills, turns out daily 150 tons of finished black and tin plates, employs about 1500 men, boys and girls and has a monthly pay roll running from $58,000 to $60,000.

The new tin plate mill, which is located just across the Shenango River from the present establishment, 40 acres of land having been secured for its site, will have 30 hot mills and 28 cold mills, with a probable capacity of 300 tons per day. It will furnish employment to about 2000 people. This isn't "boom." It is business. When the project was started it took but from 11 o'clock in the forenoon until 6 in the evening to get $500,000 in cash subscriptions to the stock. The money is ready, the contracts let for the work, and it is already going on.

The Shenango Valley Steel Company are the parent corporation of both tin plate companies. Their president is W. E. Reis, their vice-president, William Patterson. The stockholders of the New Castle Steel & Tin Plate Company were largely stockholders in the other corporations. When the tin plate works were started, Phelps, Dodge & Co. of New York, the largest importers of tin plate in the country, began buying from and selling for them. Later the firm bought stock in the concern. When the new tin plate organization was formed the principal movers in the matter were also stockholders in the Shenango Valley Steel Company and the New Castle Steel & Tin Plate Company. Lately it has been deemed best to consolidate all three, and this consolidation goes into effect on July 1, 1898. The stock of the consolidated organizations will be $2,500,000. Phelps, Dodge & Co. have largely increased their holdings of stock.

The Shenango Valley Steel Company's mill has a rolling capacity of about 1000 tons per day. They are now building a bar mill to make tin plate bars 16 inches wide. This size may be increased to 20 inches. These additions will nearly double the capacity of the establishment, and will be completed by February 1. They now own the Red Jacket furnace and control the Norway furnace. In addition two new blast furnaces are contemplated. The monthly pay roll is now about $50,000. With the completion of the new tin mill and the addition to the steel mill, it may run up to $150,000 a month. When the iron ore goes into the flaming mouths of the furnaces its process of development, in practically one establishment, ends in steel and tin plate, and, through allied concerns, wire rods and wire nails.

There is also another tin plate plant in process of construction. The Arethusa Iron Works, a six-mill sheet plant, are being converted into a tin plate mill. The new organization is the Neshannock Sheet & Tin Plate Company, with George W. Johnson at their head. They will have six hot mills and six cold mills, the latter driven tandem. The foundations for the tinning department are being laid, and it is expected that the establishment will be in running order by January 1. The anticipated daily output is 50 tons of tin plate, and the mill will furnish employment to 250 or 300 people.

Getting away from tin plate—that bone of contention between political parties in late years—the New Castle Wire Nail Company claim attention. This company have a rod mill which makes the rods their nail factory turns into wire nails. It has a capacity of about 125,000 kegs per month or 70,000 gross tons per year. It employs about 700 men and its monthly pay roll aggregates about $30,000. Its product is shippied from Portland, Maine, to Portland, Ore., and even to South America and Japan.

The Rosena Furnace, one of the largest in the world, owned by the Oliver & Snyder Steel Company, is in operation. It has a remarkable capacity and furnishes employment to a great many men. The Norway Iron & Steel Company's furnace, with a capacity of 250 tons per day, is also running. The Atlantic Rolling Mill, one of the oldest in the country, has been, through business troubles, idle and in the hands of a receiver for some time past. The receiver has just been relieved of his duties, a reorganization effected and the big establishment is likely to be soon in full operation.

SCRAP.

The stock of foreign Tin Plates in bond at the port of New York at the present time is lower than ever known before. The amount reported on October 1 in the official monthly statement of dutiable goods in bonded warehouses was 1,826,742 pounds, valued at $42,070, as against 4,038,922 pounds, valued at $77,318, on the corresponding date of last year

The Port Talbot Tin Plate Works, Port Talbot, Wales, were recently put up for sale at auction. As only one bid, of $25,000, was made, the property was withdrawn.

The two new mills contracted for by the Pennsylvania Tin Plate Company, New Kensington, Pa., will probably be in operation by January 1 next. This will give the concern a complete modern six-mill plant, with a capacity of about 24,000 boxes a month.

The Leechburg Foundry & Machine Company, Pittsburgh, Pa., have booked an order for a three-high modern Bar and Skelp Mill for the La Belle Iron Works, Wheeling, W. Va.

The United States Tin Plate Mfg. Company, Demmler, Pa., have placed an order with the Totten & Hogg Iron & Steel Foundry Company, Pittsburgh, Pa., to equip their mill with Freeman's Patent Furnace Charger for charging their annealing furnaces. They have also ordered a Mesta Patent Pickling Machine from the Leechburg Foundry & Machine Company of Pittsburgh.

The Ferguson Tin Plate Company, who operate a dipping plant at East Liberty, Pittsburgh, have been looking about for some time with a view of removing their plant and rebuilding on a much larger scale. It is the intention of the concern in the event of rebuilding to erect a much larger plant, and also build a three and four mill plant for the manufacture of Black Plate. Negotiations are now in progress with parties at Uniontown, Pa., and it is possible the plant will be removed to that place. It is understood that the concern have secured a large tract of land adjoining Uniontown and will build a new town if the citizens will buy $125,000 worth of lots, the proceeds to be held by Uniontown banks and applied to payment for the new plant.

Wm. J. A. Bolles, brother of C. H. Bolles, Jr., the New York representative of Merchant & Co , Inc., was married Wedesday evening, November 10, to Miss Willmarth of Brooklyn. Mr. Bolles has been connected for several years with Merchant & Co., acting as salesman among the Brooklyn trade, where he is well known, and he has also had charge of their Brooklyn warehouse at 584 Flushing avenue. He and his wife made a wedding trip to Washington and other points in the South.

George Shaw of Bellevernon, Pa., chief engineer of the National Tin Plate Company, was among those who were recently proposed for membership in the American Society of Mechanical Engineers.

The Wais & Roos Punch & Shear Company, Cincinnati, Ohio, report the number of inquiries for their productions very much on the increase within the last 30 days. The company have in course of construction a large number of Special Rolling and Tin Plate mill machines for such firms as Carnegie Steel Company, Pittsburgh ; Ætna-Standard Steel & Iron Company, Bridgeport, Ohio ; Reading Iron Company, Reading, Pa. ; Laughlin Nail Company, Martin's Ferry, Ohio ; Johnstown Tin Plate Company, Johnstown, Pa., and Midland Iron & Steel Company, Muncie, Ind.

The export of Tin from Tasmania in the first six months of 1897 amounted to 1143 tons, as against 2700 tons for the entire year 1896. The falling off in output this year was in the alluvial Tin Ore districts and was due to scarcity of water. The output of the great Mount Bischoff mine was well maintained. The company who own the mine continue to pay regular monthly dividends and since it started up to June 30, 1897, $6,988,800 of profits had been distributed.

A local paper states that the city of Port Angeles, Wash., has raised a bonus of $75,000 in cash and land for the establishment of a Tin Plate plant at that place. A company of Pittsburgh capitalists are reported as about to put up at once a Black Plate mill and Tinning plant. Coal of excellent quality is said to have been located within a few miles of Port Angeles, which is located on the Straits of Juan de Fuca, almost exactly opposite the city of Victoria, British Columbia.

THE RETAIL STORE.

James S. Hagerty.

In onr last issue brief reference was made to the death of James S. Hagerty, senior member of the well-known tinware manufacturing house of Keen & Hagerty, Baltimore, Md., after a comparatively short illness, from a complication of diseases. The following particulars have been obtained regarding the career of this prominent member of the tinware trade: James Summerfield Hagerty was a son of the late James Hagerty of Baltimore, and was born in that city 68 years ago. When quite a young man he established, with the late George V. Keen, the firm of Keen & Hagerty. For years the office, salesrooms and factory were all located at Calvert, Water, Grant and Hollingsworth streets. During the present year salesrooms were established on West Baltimore street, near Charles, and an additional factory erected in South Baltimore, bordering on the tracks of the Baltimore & Ohio Railroad. The firm now employ 600 hands and have a dozen traveling salesmen. Several years ago James R. Hagerty, George V. Hagerty and Summerfield Hagerty, sons of Mr. Hagerty, with C. L. Wagandt, were taken into the firm. Mr. Hagerty was very active in all matters pertaining to the benefit of his native city, and was specially prominent in the movement for providing adequate street transport facilities. He was one of the originators of the Baltimore Citizens' Railway in 1870, and was its first and only president. When it was merged in the other city railways he was elected a director of the Consolidated Company. For 25 years Mr. Hagerty was snperintendent of Grace Methodist Episcopal Sunday school, and of recent years was recording steward of the church. He was also a director of the Third National Bank of Baltimore. A widow and four sons survive him. The latter are James R., George V., Summerfield and Oliver P. Hagerty.

Changes in New York Hardware District.

A public notice recently given by the Department of Public Works of New York City, under authority of the State law of March 17, 1897, to all owners and occupants of the buildings on the site bounded by Chambers, Centre and Reade streets, up to the building of the American News Company, to vacate their premises on or before November 26, will involve a number of changes of location on the part of important hardware houses in the Chambers street district lying east of Broadway. The buildings are to be sold at public anction, and after demolition will make way for a Public Record Building, to be erected on the site. Among the concerns which will be obliged to move are Peck, Stow & Wilcox Company, U. T. Hungerford, Stanley Rule & Level Company and Sargent & Co.

Of these houses, Peck, Stow & Wilcox Company, now at 27 Chambers street, have leased the premises lately occupied by the Atlas Tack Corporation, at 31 Warren street and 27 Murray street. They have the street floor and two basements running through from Warren to Murray street. A force of workmen are rearranging and remodeling the floors, and the company expect to move in the near future.

U. T. Hungerford, 29 Chambers street, New York, has leased the entire building, 121 Worth street, and will occupy the premises as soon as they can be renovated and refitted. The building has six stories and a cellar, each 80 x 22 feet, and is very convenient to the brass district. The street floor will be used as a shipping department, with offices one flight up. The remaining floors will be used to store stock. Mr. Hungerford will continue to carry a large stock of sheet copper and brass, seamless brass and copper tubing, brass rods, brass and copper wire, brazed brass tubes for gas fixture work, soldering coppers and a general line of brass and copper goods.

Stanley Rule & Level Company, 29 Chambers street, have leased an entire floor in the Cary Building, 107 Chambers street. They have the first floor above the street, directly over the Union Nut & Bolt Company. The floor extends clear through to Reade street, and is 150 feet long by 25 feet wide. The company expect to be moved before December 1, and in their new home will have greatly improved facilities and more commodious accommodations.

Sargent & Co., partly owing to the large space required and the short notice given, have decided to avail themselves of a fine modern buiding at 149, 151 and 153 Leonard street, about 100 feet east of Centre street. This structure, built within the last five years, occupies a site 115 feet deep, with a frontage of 70 feet. They will occupy the entire building, in all seven floors and one basement. Alterations are being pnshed forward, and they expect to occupy the building by December 1, or not later than the first of the year.

A Hustling Salesman.

The following item is taken from a recent issue of the Troy *Record*, and may prove interesting reading to dealers: A well-known uptown hardware dealer has in his employ a brother who is a hustling salesman. A few days ago a customer came in the store and made a purchase of some hardware, and after paying for it began to inspect the stock of stoves on hand. He was intently gazing on a parlor stove of beautiful design, when the hustling clerk came forward and said: "That's a nice stove." The customer agreed with him and the clerk proceeded to induce him to buy one by asking him how he would like to have one like it. The customer said he was well supplied at present, and in reply to a question of the clerk, said he used an Atlas. "An Atlas," repeated the clerk; "why, my dear man, you should have an Andes in your honse. They are the greatest fuel savers in the world." Taking his derby off his head, he continued: "You could put a block of wood in that stove the size of this hat and you would get all the heat you wanted out of it for 36 hours, and the next day you could take it out and sell it for charcoal." The customer took one look at the clerk, picked up his bundle, and made a double quick exit from the store.

Agate Nickel-Steel Ware.

Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, have brought out what they term Agate-Nickel Steel Ware. Originally they used a fibrous iron made by the charcoal process, which was coated with a gray enamel mottled by oxidizing the surface of the metal. The revolution that has taken place in late years in the production of steel, both by the Bessemer and Siemens Martin processes, has led manufacturers to seek a method of applying enamel on steel, instead of Iron, on account of the reduced cost of Steel. The usual process, however, applied to fibrous Iron could not successfully be applied to Steel or to other homogeneons metallic surfaces on account of the density and closeness of the metal. The resulting difficulties manifested themselves in the form of pin holes, scales and the readiness with which the enamel chipped and flaked off the metal, thus destroying the finish, beauty and durability of the article. In enameling the addition of arsenic, lead or antimony to the glaze is said to give an adhesion that it lacks without these ingredients. The use, however, of such elements may under certain conditions be detrimental to health, especially if through oversight, inexperience or carelessness they are not properly mixed.

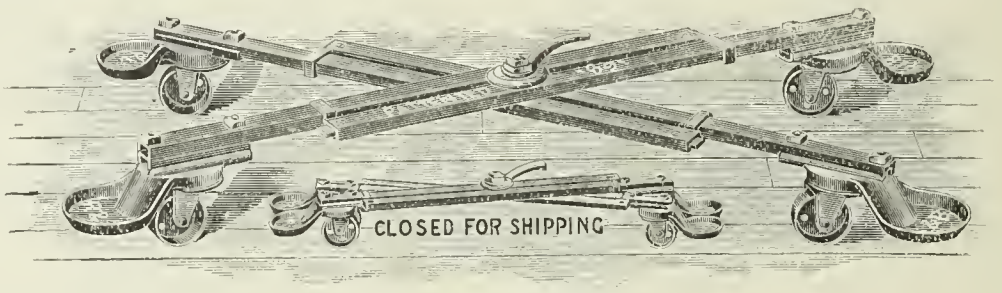
To take advantage of the lower cost of steel and yet successfuly coat it, has led the Lalance & Grosjean Mfg. Company to make a series of experiments, which within the year have resulted in their placing upon the market their Agate Nickel Steel Ware. The invention which is controlled by them consists of an interposition of a binding film of magnetic metal, such as nickel, between the steel body and the enamel, thus enabling them to use steel for the body of the article without the necessity for employing any of the objectionable ingredients referred to. The effect of this binding film or intervening coating on the steel surface which is not capable of retaining a direct coat of enamel without it, they say, is that this intervening film enters into such a firm combination with the steel as not to be separable therefrom. In turn the enamel or glaze likewise has such a chemical affinity for the nickel deposit as to cling to it tenaciously. In other words this intervening metallic coating forms a bond that ties or binds the enamel to the steel, while without such a bond the proper enamel will not adhere.

This metallic coating is preferably applied by them by electro deposition. The electric current drives the nickel into the steel, producing substantially a nickel steel alloy, they state, of great strength, care being taken not to have the metallic coating of sufficient thickness to prevent the enamel or glaze from being mottled by oxidation of the foundation metal, the mottling being an essential feature,

giving color and finish to the article. To more clearly demonstrate this the company partially nickeled a steel dripping pan, leaving more than a third of it in its natural state. Then the entire pan was enameled. As a result that portion without the intervening coat of nickel shows where the enamel has separated from the steel. While, as stated, the same result is in a measure obtainable by the use of the ingredients mentioned, we are advised by the company they are entirely absent in the goods made under this process. In manufacturing this class of wares, after being stamped into shape and form the pieces are taken into the nickeling room, and the surface thoroughly cleansed, after which they receive the nickel deposit followed by a coat of enamel. After the articles are dried and burned they are then coated a second time with a hard vitreous covering capable of resisting the action of acids.

The Model Stove Truck.

The illustration presented herewith shows the Model stove truck, put on the market by the S. M. Howes Company, 40 46 Union street, Boston, Mass. It is made, as shown in the engraving, of steel channel bars with iron sockets for the stove legs at the end. The bars cross at the center and are held by a nut which can be loosened at pleasure and the spread of the truck changed to suit the dimensions of the stove. The Payson anti-friction casters, with specially designed plate, support the truck. When not in use, or when shipped, it is closed as shown in the lower part of the engraving, taking up very little room. The sockets at the end bring the stove down only an inch from the floor, so that it is exhibited in its original position. It is pointed out that the stove cannot be jarred out by running the truck over a rough floor, and furthermore, if one side of the stove is lifted the truck rises with it.



The Model Stove Truck.

In referring to the advantage gained by using trucks of this kind, the manufacturers reasonably argue that the dusty and time honored platform for stoves is an institution that should be dispensed with by the progressive dealer. The old notion that a stove upon a platform is shown unnaturally large is not a good argument for its retention, for the average buyer much prefers to see the stove in its natural position, and can judge more fairly of its suitability to his needs. A great disadvantage of the old fashioned platform, however, is the inability to change the store arrangement, and the same set style has to be maintained year after year, and apart from that the labor of arranging the stock is greatly increased, and unless the greatest care is taken the stoves are often out of alignment, and not placed in the best relative position for display. With a good stove truck these disadvantages are overcome, for the stock can be rearranged as often as is necessary, and in the meantime the store can be properly swept without an undue amount of labor.

MEMORANDA.

George Feist, an esteemed employee of Doremus & McKiernan, Stove Dealers, Main street, Paterson, N. J., died last week after a brief illness. He was 32 years of age, and leaves a widow. The funeral services were held at his late residence, 165 North Third street, on the afternoon of Tuesday, November 9, the interment being at Laurel Grove Cemetery.

W. A. McDonald announces that he has succeeded to the business of the McDonald Mfg. Company, 100 Nazareth street, Montreal, Canada, formerly conducted by his father, the late Thomas McDonald. The firm manufacture Tinware of all kinds, and make a specialty of light Sheet Iron and Copper work.

We have received from the Aluminum Mfg. Company, Two Rivers, Wis., Jos. Koenig, manager, a sample of an elegant Button Hole Bouquet Holder, which they are now manufacturing. The Holder, they inform us, is drawn out of one flat disk of aluminum the size of a half dollar. As it forms an oval tube 2¾ inches in length by ⅜ inch wide the article shows a superior piece of mechanical art. The hook for fastening the holder in the button hole takes the form of a small fern leaf.

In preparation for the winter and spring trade the Youngstown Specialty Mf'g. Company, Youngstown, Ohio, have issued a little pamphlet relating to maple sugar supplies. These include Sap Spouts, Can Trimmings, Syrup Cans, round and square ; Sap Pails, tin and galvanized iron ; Sap Pail Covers, &c. All these goods are illustrated, particulars are given where necessary and price-lists of different sizes.

Henry H. Tousley, Saranac Lake, N. Y., is building a new store, which he expects to have ready for business by March 1 next. Mr. Tousley will carry a full stock of Shelf and Heavy Hardware, Stoves, Sporting Goods, &c. He advises us that he would be pleased to receive catalogues and price-lists from manufacturers and jobbers.

Hoff & Bro., wholesale and retail Hardware, House Furnishing Goods, &c., Reading, Pa., have lately completed a two-story brick annex to their store. The firm refer to business as very much improved.

A. J. Aldrich will shortly open a new Hardware store at Elkton, Mich. Mr. Aldrich's stock will comprise Shelf and Heavy Hardware, Agricultural Implements, Tinware, Stoves, Sporting Goods, &c.

H. L. Cook & Co., a new firm, are opening up in the retail business at Aberdeen, Wash. They are carrying a line of Shelf and Heavy Hardware, Stoves, Tinware, Implements, Sporting Goods, &c. They are also manufacturers of artificial ice.

D. C. Huskins of Sloan, Iowa, and Hiram S. Gordon of Macon, Mo., have formed a partnership in the Hardware business at Sloan, Iowa, under the style of D. C. Huskins & Co. They are carrying a stock of Shelf Hardware, Stoves, Tinware, Glassware, Wagons, &c.

E. C. Spencer has opened a new stock of Hardware in Gebo, Mont. Mr. Spencer is retailing Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, &c.

J. L. Weaver, dealer in Shelf and Heavy Hardware, Tinware, Stoves, Implements, &c., Parker, S. Dak., has sold out to Harper, Jones & Co.

Lyman & Clawson, Pittwood, Ill., have opened a new Hardware store, handling both Shelf and Heavy Hardware, Tinware, Stoves, Agricultural Implements, Sporting and Athletic Goods, &c.

C. H. Resimins is about opening up in the Hardware business at Rib Lake, Wis. He is occupying a new building, 26 x 70 feet, and will carry a full line of Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c. A Tin shop will also be conducted.

The Sidney Hollow Ware Company, Sidney, Ohio, inform us that there is to be no change whatever in the style of their name and the management continues as heretofore. This announcement is made on account of recent publications regarding the sale of the plant.

Geo. William Hoffman, Indianapolis, Ind., manufacturing the United States Metal Polish, issues specially prepared printed matter relating to the merits of the Metal Polish, also giving the locations of principal repositories throughout the United States, and is distributing thousands of unique samples of the polish itself, which he will be glad to forward to any one addressing him upon the subject.

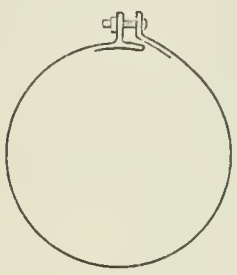
Stark & Tesch, retail Stove and Hardware dealers, doing business at the corner of Appleton and Edward streets, Appleton, Wis., favor us with a large poster, illustrating some of the goods in the cooking and heating line which they handle. Prominent among these may be mentioned the Stewart Base Burner, the Stewart Oak, the Stewart Range and the Stewart Hot Blast, the latter being referred to as something new and as burning wood lying flat instead of necessitating its being set on end. The firm also handle the well-known Garland line of Stoves, the Dangler Gasoline Fire Place, the Ideal Oil Heater and the Robinson Tubular Furnace.

STOVE TRADE NOTES.

A CHANGED COLD AIR INLET.

BY S. A. M.

The writer recently had occasion to clean a furnace that had been in use for many years. On taking down the hot air pipes there was found in them a collection of dirt and lint that, when the air was heated, would evidently give rise to a good sized "hurnt air" theory. After the



A Changed Cold Air Inlet.—Fig. 1.—*Slip Joint Made from One Piece of Iron.*

pipes had been cleaned attention was paid to the furnace itself. It was found to be thickly covered with dust and, as a remedy, was taken apart and washed. As the water pan was set in the front over the ash door this part of the fire pot was found to be badly burned and warped. In

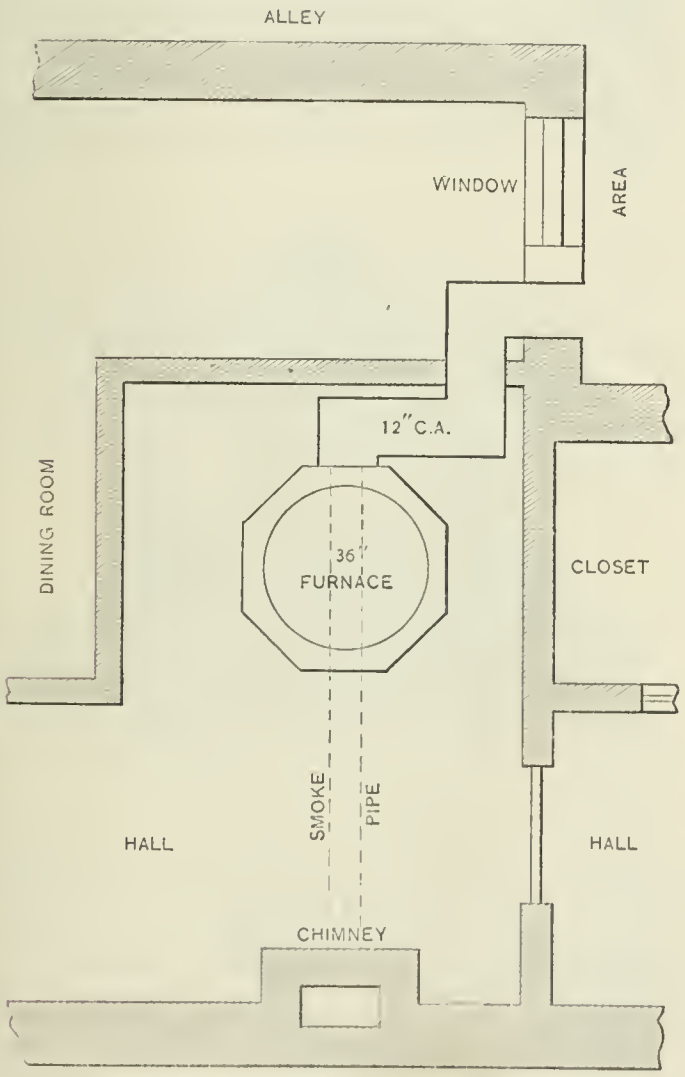


Fig. 2.—*Plan of Basement, Showing Location of Furnace and Cold Air Box*

order to save the expense of a new fire pot it was made to "'bout face." As the furnace was a portable one with a cast iron front this warping of the fire pot had raised the front from the cast iron base, thus leaving space for air to enter the fire. After cementing the joints and placing the radiator in position it was discovered the warping of the fire pot was enough to lengthen it about 1 inch, thus making the dust flue too short. To remedy this difficulty a piece of iron was bent as shown in Fig. 1, which makes a very satisfactory bandage to use when it is not convenient to lengthen the pipe by putting on another piece. By putting stove putty on the collar and pipe, then over the band, a smoke tight joint was secured by means of a stove bolt.

In Fig. 2 is shown a plan of the furnace and cold air inlet. It will be seen from an inspection of the plan that the furnace is situated, as are many furnaces in city residences, in a recess left for the purpose. The cold air inlet was round and 12 inches in diameter. A square box was set in the wall, and from this the pipe extended through the partition and then down to another box which was

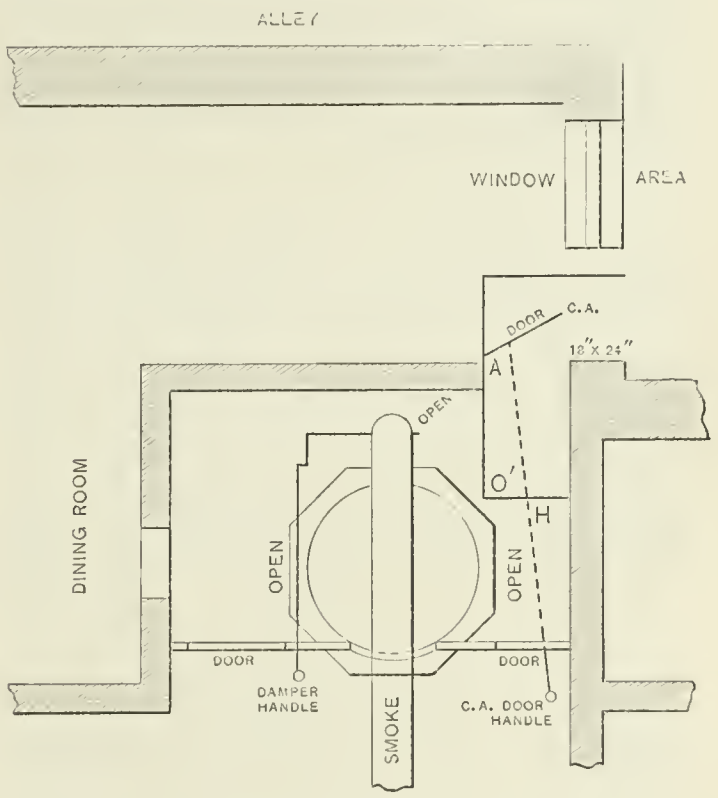


Fig. 3.—*Plan Showing Change in Cold Air Inlet.*

connected with the base of the furnace. There are connected with the furnace one 7-inch, three 8 inch and three 9-inch heating pipes, giving a total of 382 square inches. Deducting one-fourth, the result would be 287 square inches as the required area of the cold air inlet. As the area of a 12-inch pipe is 113 square inches, it will be seen that the round pipe was not one-half of the required size. The previous winter the parties occupying the house had burned a large amount of coal and had received only a small amount of heat in the rooms above. About the only place in the house that would be warm was the basement hall. As the cold air inlet passed down by the smoke pipe, and the heat radiated from this pipe and from the furnace would heat the inlet pipe, the air would be warmed and thus destroy the draft. Another defect was the small opening into the base of the furnace, it being only 6 x 17 inches, which is less than the area of the 12-inch inlet. When it is taken into consideration that the cold air inlet should have an area of 287 inches, and the opening into the furnace had only 102 inches, we can plainly see why the furnace refused to operate with such a small supply of cold air. Not only this, but there was

no provision made by which the cold air from the house or basement could be taken through the furnace during the night or when the house was cold.

The result of this defect was shown in the galvanized iron casing, for the zinc coating was burned off from both the upper and lower sections of the casing. When the lower casing is burned it is an indication that there is a deficiency in the cold air supply. To remedy the difficulty it was decided to enlarge the cold air inlet. Accordingly, the old pipe was taken out and an opening made in the outer wall extending from the window frame to the wall and as high as circumstances would permit. The size of the opening was 18 x 24 inches, giving an area of 432 inches. A similar opening was made in the partition separating the dining room from the furnace. A wooden box was made in the dining room by nailing strips of wood to the ceiling, wall and partition, then boarding the two sides and bottom. Two sides of the octagon base of the furnace were taken out, thus giving three openings having a combined area of 216 inches, which was all that could be given on acccount of the peculiar construction of the furnace.

It was then decided to depart from the usual custom in the construction of cold air inlets and make an air chamber of the recess. Accordingly the space between top of furnace and side walls was covered with iron, and the space between partitions and cast iron front treated in a similar manner. Pieces of wood were run from the floor to the iron roof and two wooden doors hung, as shown in Fig. 3. The cold air inlet was continued down to within about 1 foot of the floor, thus giving the air every opportunity to circulate about the base and enter the three openings. These two doors were provided so one could enter the cold air chamber at any time, and for another reason, which will appear further on. A door was hung in the cold air inlet at A and a rod connected with it, so the door could be opened or closed as desired. Marks were made on the wall so the position of the end of the rod would indicate whether the door was open full, closed, or partly closed. At night the cold air door is closed and one of the doors opened into the air chamber, so the air in the house can circulate through the furnace. That the smoke pipe damper could be operated conveniently a crank and rod were connected with the damper, the rod extending through the front. In order that the heat collected in the air space should be utilized an opening, shown in Fig. 3, was made in the partition, thus allowing the heated air from the furnace casing and smoke pipe to enter the dining room. As there was more heat derived from the top of furnace casing, heating pipes and smoke pipe than was desired in the hall, the elbow connecting the furnace with the pipe leading to the bathroom was taken out and a tee placed in its stead, a damper being placed in the branch near the furnace and the open end, so the heat from above the furnace could be directed into the bathroom, or this damper could be closed and the other opened, thus allowing the air from the furnace to go to the room.

As a result of this change in the cold air inlet the various registers give out a great volume of heat and the basement hall is no longer the warmest room in the house. It was not considered necessary to show the various heating pipes in Figs. 2 and 3.

PROFITABLE PRICES

In a recent conversation one furnaceman who did a large business inquired of another furnaceman whose business was by no means so large in the number of furnaces sold, how it was that he could afford to do the character of work he did. He replied that he got the right price. In return the former said that he could not get the price, and in explanation the higher priced man stated jokingly : "It is because your trade do not have confi dence in you on account of your low prices. They know that real, first-class work cannot be done at the price which you offer. It is customary for the buyer to always haggle over a price and secure a reduction if he can, and I have quite a bit of trouble to secure the prices which I ask. I make it a point, however, to talk quality on the principle that if the work did not suit the man the price wouldn't suit, whatever it might be. After you have thoroughly impressed him with the fact that you know how to do good work, and will do good work, you can make the price as much lower as you like, but the inducements which are presented in the low price will not fetch him. There is another thing which I consider very foolish in you. You sell a large number of furnaces and are not satisfied with the price, and naturally the profit derived is less than you would desire. You, however, have supplied the market—in other words, killed the goose which is to lay you your golden eggs. You have neither made a profit nor have you raised the standard of work or price, and you must hunt on the same line of argument for your customers, who will exact the same price. Not being accustomed to spend the time in educating your buyer, nor ready with the information that must be given him to make him pay a higher price, you continually get deeper into the mire of furnishing the supply without receiving the profit. On the other hand, I don't sell so many furnaces. I put in a good deal of time on education, and when I do sell there is a balance in my favor that you seem to be deprived of. I would suggest that you change your methods ; talk quality instead of price ; sell quality instead of quantity, and make profit on the small sale."

CHICAGO HEATING TRADE PROSPECTS.

An extended inquiry among the Chicago manufacturers and dealers in heating appliances shows a general abatement in the demand. Hot water heaters and steam boilers are not nearly so active as three or four weeks since, when all houses were enjoying a fairly active trade. New work is being finished with the close of the ordinary building season, and not much is offering in the line of repair work or reconstruction of heating plants in old buildings. The warm air furnace trade is holding up somewhat better, probably because a larger proportion of the business done in this branch is in replacing worn out furnaces with new constructions. All of the furnace houses, however, are not equally busy, some of them having found the demand quite moderate during what might be termed the rush season.

Substantial unanimity is found respecting prospects for future business. Much figuring is going on with architects, contractors and owners, presaging activity in the building trades in the coming year. Arrangements are being made in numerous instances for undertaking work very early in the spring, so as to push construction to completion about the time of the renting season. Operations in the building line have been so quiet in Chicago for the past three years that the prospects of a great increase in activity are hailed with much pleasure.

The Active Acorn Range.

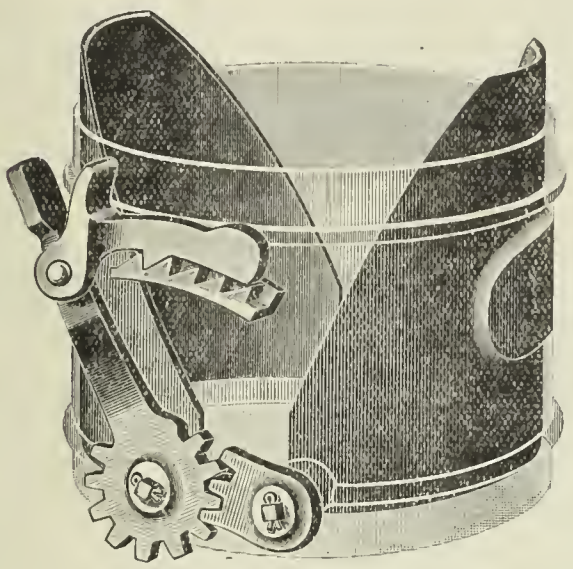
Rathbone, Sard & Co., Chicago, have issued a remarkably handsome catalogue of their Active Acorn steel oven ranges. This catalogue does not comprise many pages, numbering only eight, but in point of attractive features it outclasses many publications vastly more pretentious. The pages are 9½ x 12 inches, affording wide margins for the reading matter. The four central pages present superb views of the ranges in as many different styles. A blue paper cover incloses the contents, and on the cover is a daintily embossed title. The paper used is of heavy weight and highly calendered. Those who receive this document are not likely to throw it aside without examination, while it is more than probable that it will be preserved for future reference. The Active Acorn has proved the best selling range put on the market by this company. It is made to resemble in appearance the usual high class steel range, but it has cast iron outer walls 50 per cent. thicker than ordinary stove plate, and is therefore claimed to be much more durable than ranges made with sheet steel walls. The oven is held in place by bolts instead of rivets, as in steel range construction, which enables a new oven to be quickly put in place should one be required.

E. B. Colby & Co., Beekman and Pearl streets, New York, are making a fine display of Favorite and Cable Stoves and Ranges that should be of interest to the Stove dealer visiting New York City. In addition to

handsome Parlor Heaters with elaborate nickel trimmings and ample mica illumination they have a line of Surface Burning Cylinder Stoves. The Favorite and Cable Ranges also present a wide variety for selection, and are capable of meeting the requirements of any class of trade.

The Household Damper.

The trade will be interested in the accompanying illustrations of the Household damper, made by the White-Warner Company, Taunton, Mass., which possesses several novel and interesting features. Fig. 1 shows the damper open and Fig. 2 shows it closed. The first point to which the manufacturers direct attention is that it is



The Household Damper.—Fig. 1.—Damper Open.

eminently durable, all the working parts being extra heavy and the damper being entirely of cast iron, so that it will not rust out or break apart through corrosion. The construction is so clearly indicated in the illustrations that a description is hardly necessary. It will be seen, however, to consist of two sections which come together in a conical form, the apex being cut away so as to give a small aperture for the passage of gas. When the damper is open, as in Fig. 1, the curved shields are thrown back so as not to reduce appreciably the area of the pipe. At the back of each shield is a sort of raised

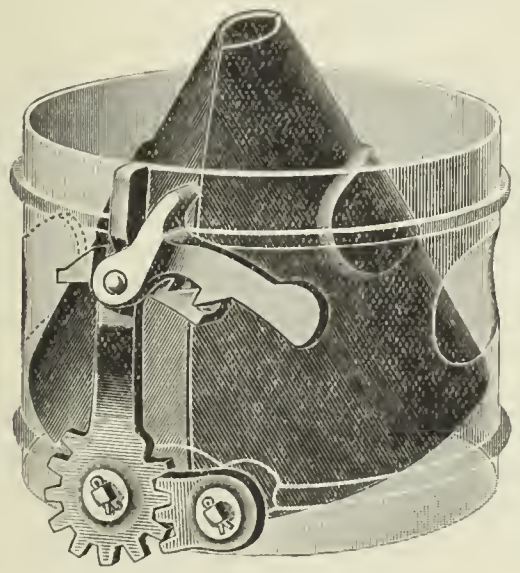


Fig 2.—Damper Closed.

panel which fits into holes in the pipe and closes them. When the damper is closed, as in Fig. 2, the area of the smoke pipe is practically shut off and at the same time two openings are uncovered in the sides of the pipe which permit the air to enter the chimney and further check the draft. The mechanism by which the damper is operated is simple and effective, and it has the advantage of positively holding the damper in any place, as the pawl and ratchet give a positive stop. The dampers are made for 6, 7 or 8 inch pipes. They are useful for steam and hot water boilers and hot air furnaces, or wherever it is desired to control the draft of a smoke pipe.

W. J. Anderson, president of the Richmond Stove Company of Richmond, Va., was married on November 10 to Mrs. George L. Cottrell.

Walker's Home Crawford Range.

Walker's Home Crawford is the name of a new range brought out by the Walker & Pratt Mfg. Company, Boston, Mass., and illustrated in a four-page circular which is now being distributed to the trade. This firm have in the past been conspicuous for the care which they have devoted to the design and construction of their goods, and this latest addition to their extensive line more than sustains their reputation for ingenuity, designing and carefulness. The first point made is that the oven is square and of the same size at the top and bottom, the oven opening in the No. 8-20 size measuring full 20 inches in the clear width, both top and bottom. The front oven plate is vertical, without the usual offset, and the oven rack may be placed at five different hights. A particular feature to which the makers allude is the system of controlling drafts, they having devised a single one-piece sliding damper for this range, thus avoiding all confusion from a multiplicity of dampers. The damper has three locations, one for kindling, one for baking, and one for checking the fire when the oven is not in use. No two dampers in this case can be set so as to interfere or counteract another, for with the single damper in kindling it is moved to the extreme right, in baking to the extreme left, and for checking the knob is placed in the middle position, each of these locations being plainly marked by letters cast on the top of the range. Not only is this system the perfection of simplicity, but the damper itself is simple and can be instantly removed without tools by unscrewing the nickel knob which moves it. Great care has been taken in the construction of this damper to make it tight, this being accomplished in two ways: 1, By inclining the damper so that by its own weight it fits closely the plate on which it slides; and 2, by planing accurately both the damper and the seat on which it rests. These planed surfaces make the damper slide smoothly and straight and give a close fit, while having it inclined makes it independent of wear, for the longer it wears the tighter it should become. Precautions are taken against waste of heat by making the upper flue strip with cup joints at the top and bottom, thus providing double self packing joints. With this range three styles of grate can be furnished, a plain one-piece flat grate, a triple shaking grate and an improved dock-ash grate, the latter being recommended because of the new and simple way in which the gears are attached, enabling either bar to be taken out readily or replaced. The range is provided with an exceptionally large ash pan, has triple oven back, composed of two cast iron plates with asbestos filling and removable top oven plate, which can be taken out without disturbing the top of the range. The manufacturers have given much attention to the design, and have avoided, as far as possible, straight edges to the top of hearths and shelves, curving all possible edges so as to remove the box like appearance and stiffness, due to bounding a range by right lines. All the edges are finished by convex steel rails nickel plated over copper. The Crawford heat indicator is furnished with every range.

Stove Plates Cast at Durham Furnace.

At a recent meeting of the Numismatic and Antiquarian Society in Philadelphia, a paper was read by Charles A. Laubach of Kiegelsville, Pa., relative to early heating apparatus and to the stove plates cast at the Durham Furnace from 1741-1791. The author began by stating that iron stoves were unknown before 1678, when Prince Rupert of England attempted to convert a fire place into a furnace. This, he says, was the first attempt to force smoke back over the fire and create heat for warming apartments by the aid of iron. Early in the eighteenth century, about 1710, Count Polignac of France made an attempt to convert an ordinary fire place into a heating apparatus by simply constructing a fire place with an iron back, hearth and jambs. The result was only a slight saving of heat. In 1716 Doctor Desangliers of London succeeded in improving the Polignac fire place so that it could be used for burning coal.

The first attempt at manufacturing heating apparatus at Durham, Pa., was in 1741, by the Durham Furnace Company. The firm consisted of George Taylor (later one of the signers of the Declaration of Independence), James Logan and James Morgan, ironmasters (the latter being the father of Gen. Daniel Morgan, the hero of Cowpens).

The 1741 stove pattern was called the "Adam and Eve," from its embellishment. It was in the form of a box, 2 feet square, without side or oven doors, having merely one door in front to supply it with fuel and draft, and a hole on top to allow the escape of smoke. The stove was designed by its inventor to instruct as well as to supply comfort, having inscribed, in raised characters, the date 1741, surrounded with fine scroll work. Above this were raised figures representing Adam and Eve, the serpent, several fruit trees, and a variety of animals in the background. In 1745 Franklin invented the famous stove

which bears his name. This pattern continued to be cast at the Durham Furnace until 1774, and probably later.

In 1756, when the furnace was leased and operated by Captain Flowers and James Morgan, a new design of stove was invented by the firm and cast at the furnace. The side plates were highly embellished with scroll work and the following inscription :

"DIS. IS. DAD. YAR. DER. WELD 1756."

In 1774, when George Taylor, Samuel Williams and James Morgan were the members of the firm operating the Durham Furnace, a new model of a stove was constructed with the inscription : "Durham Furnace, 1774." This was surrounded by a wealth of fine scroll work. A portion of a stove with the above inscription and date thereon was for many years placed in a conspicuous position in front of the Easton, Pa., post office.

In 1779 Richard Backhouse became proprietor of the Durham Iron Works. During the Revolution he supplied Washington's army with shot, cannon balls, canister and grape. At the close of the war he commenced the manufacture of stills, steel wagon springs, stoves and stove pipes, in addition to pig and bar iron. In 1785 he invented an improved ten-plate stove, constructed with stove pipe attachment, as at that time stove pipe was considered a luxury. In 1789 the Valentine Eckert pattern stove was largely cast here and at the Sally Ann Furnace, near Allentown, Pa. Captain Valentine Eckert, of Revolutionary fame, had in the year 1789 a neat model of a stove constructed, which was largely cast at Durham and at the Allentown and Reading Furnace. The stove bore the inscription : "Valentine Eckert, Sally Ann Furnace," scroll work and the American eagle, carrying the motto "E Pluribus Unum" in its mouth. It is curious to note, according to the Durham Furnace ledgers, that the various stove patterns—Adam and Eve, 1741 ; Franklin, 1745 ; Philadelphia, 1755 ; Captain Flowers and Morgan, 1756 ; George Taylor, 1774 ; Mount Pleasant, 1780 ; Richard Backhouse, 1785 ; Captain Eckert, 1789, and Pettibone, 1781—were frequently exchanged among the various furnaces and forges in Pennsylvania and New Jersey and cast at designated furnaces to supply the needs and tastes of the inhabitants of the surrounding region.

ODD PLATES.

The Wolff Gas Radiator Mfg. Company, 445 Greenwich street, New York City, report a lively demand for the Wolff Gas Radiator, which, being the pioneer in this method of heating, enjoys a wide popularity. They are also introducing this year a new design of Fire Place Heater, which is said to be very effective and economical in the consumption of fuel. Circulars describing these goods can be secured on application.

George Starrett, 227-229 Water street, New York, has recently treated his building to a coat of light brown paint, against which he has painted in large and conspicuous letters signs stating that he has "Stoves for export," "Steel Ranges," "Russia Sheet Steel," "Portable and Brick Set Caldrons," "Air Tight Heaters," and that the business was established in 1844. Mr. Starrett makes a specialty of Richmond Ranges and Hot Air Furnaces, and is handling Moore's Air Tight Parlor Heater in the East.

A. L. Canfield, manager of the New York office of the Danville Stove & Mfg. Company, Danville, Pa., is showing in his salesroom, at Beekman and Pearl streets, a handsome line of Square Parlor Heaters, under the name of Beaver. A high grade Heater is called Prince Beaver and a medium priced and very attractive Square Parlor Heater is called the Ideal Heater. The Danville Oak is another of their newer attractions, and the King Beaver and Monarch Beaver Ranges have been very popular sellers and well adapted for leaders to any line of Ranges. He is showing as seasonable goods the New Monarch Gas Fires, which are of the open type with copper reflectors, needle valve for controlling supply and adjustable air mixers.

The fire which visited the works of the Kling Stove Company, Gallipolis, Ohio, on November 5, partially destroyed their molding room, but the damage resulting was principally in connection with the building. The company were obliged to stop work for about ten days, but on November 15 they made their first heat and never missed filling an order. The company have only made temporary repairs, as after January 1 they expect to enlarge their plant in order to meet the growing demands of their business. They are now running full blast as before the fire.

The Estate of P. D. Beckwith, Dowagiac, Mich., sole manufacturer of Round Oak Stoves and Furnaces, has achieved a peculiar and enviable distinction, which is well worthy of universal circulation. Michigan Labor Commissioner Fox has made a statement to which the following reference appears in a recent issue of the Dowagiac *Daily News* : "The information given out by this official was that during the year just closed the Round Oak Stove Works of this city had paid the highest wages of any manufacturing institution within the borders of Michigan. This is a high compliment to the Beckwith Estate, its management and to the city of Dowagiac, which every citizen will take pride in sharing. This announcement, coming as it does from this high official source, and going the rounds of the press of Michigan and adjoining States, will have a hearty and wholesome effect upon Dowagiac in a commercial sense, which it would well become our citizens to appreciate."

The Dighton Furnace Company of North Dighton, Mass., are meeting with a very gratifying demand for their leading specialties, and we understand that they have sufficient orders on hand to keep them running some time.

Articles of incorportion of the Thatcher Furnace Company were recorded in the County Clerk's office at New ark, N. J., on November 10, the capital stock being placed at $100,000. The incorporators are Charles O. Lyon of Milburn, Edward Benedict of Brooklyn and Lewis M. Thatcher of Franklin, N. J.

TRADE NOTES.

A charter has been applied for by the directors of the new Scottdale Rolling Mill Company of Scottdale, Pa. organized by the striking employees of the Scottdale Iron & Steel Company.

The Weir Filter Company is the title of a new concern just incorporated in New York City to manufacture Filters, with a capital stock of $100,000. The directors are Henry Aplington of New York City, Charles H. Squire of Port Richmond, Regis H. Post of Bayport, John T. Cutting and Bryce Metcalf of Rosebank.

The Alert Brass Company of Brooklyn, N. Y., have been chartered, with a capital stock of $10,000, by Minnie Steinberg and Charles Steinberg of New York City and T. C. Roberts Horsfield of Brooklyn.

Among recent incorporations of new companies in the office of the Secretary of State of Missouri was that of the St. Louis Aluminum Casting Company of St. Louis, Mo., with a capital stock of $25,000. The directors are T. E. Crecelius, G. A. Plens, O. A. Stifel and others.

The Alpha Paint & Mineral Company of Philadelphia, Pa., were recently incorporated, with a capital stock of $1,000,000, by James H. C. Barr, Frank A. Brunner and Thomas S. Johnston.

The directors of the new sheet mill recently organized at Scottdale, Pa., have elected John S. Parker president and B. F. McCann secretary.

A table compiled from the register at the rooms of the New York City Merchants' Association shows that from August 9 until the expiration of the limit of time on the reduced railroad rate tickets, 3781 merchants from 49 States and Territories and 51 merchants from outside the United States visited the rooms of the association. Nearly all these merchants were brought to New York through the efforts of the Merchants' Association. The association now has over 26,000 non-resident members and about 1200 resident members. Four series of excursions were arranged for during the early fall months, tickets being good for 30 days in each case.

Five thousand additional small arms of the new navy pattern are to be purchased by the Ordnance Bureau at Washington, in order to have on hand a reserve supply to replace rifles damaged or otherwise put out of use and to provide a sufficient number of small arms for any emergency requiring a sudden increase in the enlisted strength of the navy. Between 10,000 and 11,000 of the new arms were purchased under the original contract, all of which have been distributed. A few ships, however, are not yet provided with the new weapon. A number of naval officers are understood to be opposed to the new rifle, their objections being based on the smallness of the bullet. The Chief of the Bureau of Ordnance, Captain O'Neil, however, and other rifle experts, hold the new arm to be the best weapon yet produced for the purposes of navy use.

In spite of the strong opposition which exists in the city of Philadelphia to the leasing of the municipal gas works, Mayor Warwick of that city on Saturday signed the ordinance recently passed by the City Councils agreeing to a lease of the works to the United Gas Improvement Company, under a rental of $1,000,000 a year for 30 years, the company agreeing to spend $5,000,000 on improvements in the works. The value of the plant is estimated at $30,000,000.

TRADE REPORT.

METAL MARKET.

Pig Tin.—There has been a very good movement of stock into consumption and into interior distributive channels. The arrivals, or the equivalent, thus far this month have, in fact, been so closely taken up that wholesale prices hardened without speculative support or "official" boltsering. A fair retail trade is reported. Jobbers quote 14¾c. per lb. for Straits Pig in small parcels. The shipments from the Straits during the first half of November were cabled as having been only 1485 tons, of which 675 tons were consigned direct to the United States.

Copper.—The demand has not improved, and competition between several sellers has increased somewhat. Nothing remarkable has occurred in this connection except the formation of a basis for surmise that the market is not actually as steady as it may be made to appear on the surface in some quarters. In any event, more buyers than one claimed that no great difficulty would be experienced in placing orders for Lake Superior Ingot at ¼c. below the "nominal" prices. The export demand has been slow, and dealings in both wholesale and retail lines were very moderate. Prices for small lots from stock remain at about 12c. to 12¼c. per lb. for Lake Ingot and 11c. to 11¼c. for Ansonia Grade Casting Copper. The Copper statistics just issued by John Stanton show that the exports in October were only 8875 tons, as compared with the maximum of 13,728 tons in July.

Sheet Copper.—The local demand has eased off to some extent, and orders are irregular. Consumers are apparently buying to fill present requirements solely; as jobbers report almost all recent orders to have been for spot shipments. There has been but little purchasing for stock. Nevertheless, the aggreagate of orders for Cornice Copper in New York and its close vicinity during the past two months has been large, and considerably in excess of the corresponding period of last year, showing a liberal consumption of this material. Jobbers' prices for Sheet Copper in small lots are nominally on a basis of 15c. per lb., but some dealers are selling at lower rates.

Pig Lead.—Operations have been on a very moderate scale, and the buying interest generally has continued very tame, as is not unusual at this season of the year. Wholesale prices have slowly declined. Speculative interest has continued extremely tame, and is without influence on the market at the present time. In a retail way, sales have been merely fair in total amount, while prices are somewhat weak. American Pig in small lots is generally quoted at 4⅛c. to 4¼c. per lb.

St. Louis advices are as follows: Further weakness is noticeable in this department. Consumers have allowed their stocks to run down, and it is expected that they will enter the market before the end of the month, and if so some advance in price is likely to follow.

Lead Pipe and Sheet.—A very narrow business is reported in these materials. The consumptive demand is unusally slack with no immediate prospect of expansion, as the requirements of the building trades for the current season have been pretty well satisfied, while dealers and consumers are not laying in much in the way of stock. Stocks in second hands, however, are not heavy. In sympathy with the weakness in Pig Lead, the Eastern manufacturers have again lowered the prices on manufactured Lead to 5¾c. for Pipe and 6¾c. for Sheet, subject to the usual trade discount

Spelter.—Dealings have been on a very moderate scale, and the demand at present is slow, Eastern consumers apparently being quite well supplied. Wholesale prices are slightly weaker, but jobbers have made no reduction in their quotations for good Western brands in small lots from store. These rule at 4.65c. to 4.75c. per lb.

St. Louis advices are as follows: There is no improvement to note in Spelter. All kinds of prices prevail, and it is difficult to diagnose the market with any degree of accuracy.

Sheet Zinc.—The consumptive demand is of the ordinary routine nature which has characterized this material for many months past. Prices are unchanged. Jobbers quote 600-lb. cask lots at 5⅝c. to 5¾c. per lb. and smaller quantities at 6⅛c. to 6¼c.

Antimony.—Sales have been of ordinary jobbing character, and moderate, all told. Prices for small parcels remain quite steady, however, at 7¼c. to 7½c. for Japanese, 7¾c. for Hallett's and 8½c. to 8¾c. for Cookson's.

Aluminum.—There is no change in this metal, for which a fairly steady demand continues. Present prices are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100-lb. lots, 30c.

Tin Plate.—No improvement whatever in the demand has been developed during the past week. The market remains in a condition of abnormal dullness. Rather sharper competition for future deliveries is noted among the American mills, but it has called forth a very moderate response from either can makers, canners or jobbers. Some unusually low prices are said to have been mentioned for extended deliveries, and a few good sized orders were booked, but the volume of dealings, all told, was disappointingly meager. Spot goods are still rather difficult to secure, and mills are generally behind hand in their deliveries. Some abatement of the late stringency is noted, however. The mills are all busy, and will be so for the balance of the year. Some of them have enough work booked to carry them on without further orders until the second quarter of 1898. But a larger number of makers seem anxious to secure work ahead than were in evidence a week or two ago. To this extent, therefore, the market is somewhat weaker. The retail trade has also experienced a dull week, the run of retail orders being comparatively light in this vicinity. Prices, while somewhat easier, show no quotable change. Jobbers' quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3 45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are selling in a small way only outside of the exporting canning trade, and prices are largely nominal. Stocks of Foreign Plate are lighter than ever before.

A special London cable dispatch of November 17, 1897, reports on the British Tin Plate market as follows: Tin Plates are steady at prices on the basis of about 9s. 6d. for ordinary Bessemer Cokes, but in only moderate demand. Makers, however, seem more inclined to take orders for forward delivery at current prices. More inquiries have been received from 'Frisco and British Columbia for full weight Cokes. Oil men are endeavoring to contract for spring delivery, but their low limits on prices restrict business. Stocks at Swansea are 86,030 boxes.

Sheet Iron.—Business with the mills is somewhat less active, although some fairly large orders were booked for Black Sheets of light gauge. Jobbers' orders for both Black and Galvanized have been running very light. Prices are unchanged. Jobbers in this section quote small quantities from stock at 2.35c. to 2.40c. per lb. for No. 27 Common Black Iron and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: Black Sheets are not quite so active, although the demand is somewhat better for Heavy than Light Sheets. The mills are still busy and holding quotations firmly. Galvanized Sheets are again in better request. The demand from mill may not be quite so heavy as in October, but shipments from stock are more active than they have been. Small lots from stock are held at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—The market has been very quiet with sellers offering concessions to effect business in all lines, and only moderate sales. The export demand for Scrap metal was light, and prices rule rather lower. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3.05c.

Zinc	per lb. 2½c.
Zinc Dross in slabs	per lb. 2.60c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10 50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5.25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	5.00

THE IRON MARKET.

No decisive movement in either direction has yet taken place in the Iron trade of the country. The balance is evenly poised, and while there are indications that it is swinging in a direction adverse to sellers, too much significance should not be attached to that fact. We know of instances where shrewd, experienced managers of large interests hesitate long what course to pursue in making bids on contracts which involve deliveries extending far into 1898. The temptation of securing work for the winter months by concession is great, but when there are coupled with it engagements beyond that period the risk of being tied up when the time for reaping profits comes is regarded as a serious contingency. We find that this faith in a lively and profitable business in 1898 continues unshaken.

Steel is weaker in Pittsburgh, chiefly because offerings have been made by buyers and consumers who find that their requirements have been overestimated. The mills are not selling at the lower prices named, which have reached $15, maker's mill, in the Central West.

Wire Rods, which have occupied an abnormal position for some time past, are off to $22 at seller's mill at some points in the Central West, the business being light.

In the general lines of Finished Iron and Steel matters are very quiet. While a good deal of work is coming up, it must be recognized that it takes a tremendous tonnage to keep the great mills in fair humor.

In Foundry Iron the markets are quiet. However, consumption seems to be keeping up at a heavy rate, since furnace stocks South and North are still being drawn upon.

Pig Iron.—The NewYork market is quiet, orders being only of a routine character. Some large interests have made inquiry, but have shown no disposition to take bold as yet. Statistically, the situation is sound. The leading Southern company had reduced their stock to about 30,000 tons a few days since, as against 167,000 tons earlier in the year. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $11 to $11.25; No. 2, $10.50 to $10.75; No. 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

The Philadelphia Pig Iron market is very quiet, large buyers having pretty well withdrawn from the market until it is seen how prices are likely to go. Nobody expects much change, aud there is just a possibility that the change may be in sellers' favor, but, however that may be, buyers are inclined to wait for something more definite than is shown by present conditions. Sales during the week have been within the following range for seaboard deliveries, with the usual allowance for freight differences at points within 100 miles south and west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75 to $11.

The demand for local Coke in Chicago is not so large as early in the month, but is still considerably better than had been anticipated. The volume of trade is now smaller than shipments, but the furnace companies have booked such a large amount of business that they could pass through a period of quiet trade lasting well into the next year without accumulating much Iron. Southern sales agents report a moderate business with some little inquiry from buyers. The inquiries for local Iron project well into the future and some consumers would now like to purchase for delivery up to June at present prices or a slight concession. The producers, however, are asking more for such deliveries. The key to the situation as to prices is the attitude of Southern manufacturers. They are, however, well supplied with orders at present and consider the prospects for the future so good that they are not disposed to make concessions. The indications, on the other hand, are regarded as pointing strongly to higher prices. The demand for Lake Superior Charcoal is quiet. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

Outside of purchases of several round lots of Bessemer Iron by a Steel interest for delivery next year there has been little done in the Pittsburgh market. For balance of the year Bessemer is firm at $9.60, Valley furnace, and offers of $9.50 have been refused. It is not improbable that Bessemer Pig is about as low as it will go. Foundry Irons are weak and lower. No. 2 Foundry is weak at $10.25, Pittsburgh. We quote as follows, f.o.b. Pittsburgh: No. 1 Foundry, $10.75; No. 2 Foundry, $10.25; Bessemer, $10.25.

The Cincinnati Pig Iron market shows no material change from the condition reported a week ago. There is no buying movement at all excepting the customary run of minor orders, and it is a matter of extreme difficulty to figure out a near movement of buyers from the very limited amount of inquiry which presents itself. The chances now seem remote for very much more new trade until after January 1. As to prices, there is nominally no change and no clearly defined circumstances which would indicate anything like an immediate change as very likely. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The St. Louis Pig Iron market is practically unchanged. Agents report very few sales, and what few are taken are mostly confined to carload lots. There continues to be sales of Warrant Iron at prices which average about 25c. per ton below the figures asked for ordinary brands, but at this writing these sales have had no appreciable effect on prices. We quote as follows for cash, f.o.b. cars St. Louis :

Southern, No. 1 Foundry	$10.50 to $11.00
Southern, No. 2 Foundry	10.25 to 10.50
Southern, No. 3 Foundry	10.00 to 10.25
No. 1 Soft	10.25 to 10.50
No. 2 Soft	10.00 to 10.25

CHICAGO REPORT.

Scrap.—Trade has fallen off still more, and the demand is now quite light from consumers. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$6.75	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3 75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5 50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9 c.
Red Brass	....	7½c.
Yellow Brass	....	6½c.
Light Brass	....	4 c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—Business is below its normal volume for the season, and prices are still weak. The card on carload lots of 12 tons minimum is now as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

General business, all things considered, continues to move in fair volume, and in some sections the reports are encouraging. While it would be unreasonable to expect a rushing trade at this advanced stage of the season, there seems to be little doubt that there is a healthful distribution of goods in constant progress, and the jobbers, especially in the West, appear to have little reason for complaint. Trade in the South has been interfered with to a serious extent by the prevalence of yellow fever and the apprehensions of its spread, but it is hoped that the disturbing influence of this scourge will soon be removed and things resume their normal course. The very low price of cotton is having a depressing effect on business in that section, and the more so because there is a tendency to hold the crop in the hope of realizing better prices. The crop, however, is a large one, and this may in some measure make up for disappointment in regard to the price. Manufacturers almost uniformly refer to the improved conditions which are prevailing, and regard the outlook for future business as very promising. A weakness in a few lines is to be noted, and, on the whole, the tone of the market is not quite so confident as a short time ago. The next month or two will naturally witness a moderate business, but it is hoped that the market will hold its own pretty well and leave things in good shape for the large and more satisfactory business which is anticipated the coming year.

Advices from Chicago.—A better business is being done in Shelf Hardware. More seasonable weather now prevails throughout the Northwest, and this is naturally increasing the demand for winter goods. Coal Hods, Stove Boards, Elbows, &c., are being called for in larger quantities than had been expected. Stocks of these proved to have been smaller than anticipated. Sorting up orders are also being received for the general line of Hardware to a somewhat greater extent than for the past three or four weeks. While House Furnishing Goods are not at present very active, the falling off in this direction is made up by the demands for Tools, Cutlery and other classes of goods which are more profitable. A specially heavy movement is noted in Galvanized Sheets, as well as in goods made of such stock. Heavy Hardware jobbers report a more active demand in their line. The small shops are doing a great deal of repairing, while manufacturers are steadily drawing supplies from jobbers' stocks. Large orders are being received for wood stock from wagon makers. An active winter trade is looked for in this direction. Collections continue very good.

Advices from St. Louis.—The Hardware jobbing trade continues in the excellent condition last noted. The demand from the South and Southwest continues and tends materially to strengthen prices, which are inclined to be a trifle weak in some directions. Staple goods are being pushed, and some attractive prices are named, so as to reduce stocks to as low a point as possible for the annual inventory. This applies largely to Wire Nails and Barb Wire. Galvanized and Black Sheets are in good demand, as is also Tin Plate, but prices quoted on the latter are very low, especially for Terne Plate. Shelf Hardware is moving in good volume, and holiday goods are being ordered very liberally. Collections are quite satisfactory.

NOTES ON PRICES.

Wire Nails.—The demand for Wire Nails is only moderate, most of the jobbing houses apparently having ample supplies for the present and in some cases being in a position to sell at lower prices than the manufacturers have recently been quoting. The tone of the market is not especially strong and slightly lower prices are obtainable. New York quotations are $1.65 for small lots from store.

Advices from Chicago.—The local jobbers still appear to have excessive stocks and are making efforts to move them at inviting prices. Jobbers are selling small lots from stock at $1.50 to $1.55.

Advices from St. Louis.—The market continues weak and unsettled. Some mills are inclined to maintain prices, while others are disposed to be free sellers and shade prices accordingly. The demand at this season of the year is never heavy, and it is doubtful if the shading of prices will increase the demand to any appreciable extent. Jobbers ask $1.55 to $1.60 for small lots from store.

Cut Nails.—The Cut Nail market is in a somewhat unsatisfactory condition and is characterized by a rather weak and unsettled tone. The volume of business is only moderate. The market is at present an open one and there is a good deal of competition between the different mills. Those favorably located naturally endeavor to obtain somewhat better prices where they can do so. New York quotation for small lots from store is $1.40.

Advices from Chicago.—The trade in Cut Nails is of very moderate volume and prices for small lots are continued at $1.45.

Advices from St. Louis.—The demand for Cut Nails is very light and prices weak. Jobbers are selling small lots from store at $1.55, base.

Barb Wire.—The Barb Wire market is sluggish. Prices are unchanged.

Advices from Chicago.—Heavy shipments continue to be made by factories which have not yet begun to accumulate stock for spring trade. Prices in this line are unaffected by any disturbances among the jobbers. Quotations are continued at $1.60 for Painted and $1.90 for Galvanized in small lots from stock.

Advices from St. Louis.—The demand for Barb Wire is not heavy and prices have suffered in consequence. Jobbers ask $1.60 for small lots of Painted and $1.90 for Galvanized.

Stove Pipe and Elbows.—Manufacturers report an active demand for Stove Pipe and Elbows, and experience some difficulty in shipping goods sufficiently promptly to meet the requirements of their customers. In this condition of things the tone of the market is slightly stronger where manufacturers are in position to make immediate shipment. The demand is referred to as especially active in the West.

Coal Hods.—It is evident that some of the trade deferred their purchases of Coal Hods to a later date than usual, and as a result rush orders are being received by manufacturers and jobbers. Owing to this cause a slight stiffening in price is noticeable.

Tacks.—We have already noted the efforts of some of the Tack manufacturers to secure better prices for their product, and on the whole there has been a slight improvement in the market. It is the opinion of well informed parties that higher prices will prevail on account of the increased cost of material, and especially so if manufacturers continue to have difficulty in obtaining metal from the mills. There are, however, a number of manufacturers who are apparently willing to sell at about the old prices, and the more conservative manufacturers are disposed to let them take orders which are going at what they regard as unremunerative prices. The divergence in the quotations made on the different kinds by different manufacturers calls for very careful purchasing on the part of close buyers, but of late the tendency has been toward more uniformity in quotations.

Shot.—In the market for Shot another change in price is to be noted, together with a continuance of the diversity which has prevailed between Eastern and Western manufacturers. It is to be noted also that the manufacturers have made a modification in the classification of Shot, as shown in the following prices, which are the regular card prices in the East :

Drop Shot, sizes smaller than B, per 25-pound bag	$1.22
" " " " " " " 5 " "	.30
" " B and larger sizes, per 25-pound bag	1.47
" " " " " " " 5 " "	.35
Buck Shot, per 25-pound bag	1.47
" " " 5 " "	.35
Chilled Shot, per 25-pound bag	1 50
" " " 5 " "	.35
Dust Shot, per 25-pound bag	2.00
" " " 5 " "	.50

The Western prices are 10 cents lower per 25 pound bag. The usual abatement of 10 cents per 25-pound bag in lots of 80 bags is made, and, it is intimated, is sometimes given on smaller quantities. The St. Louis price, as noted in our last issue, is $1 base.

Sheet Lead, Lead Pipe, &c.—Under date November 13 the following reduced prices on Lead Pipe, Sheet Lead, &c., are announced. They are subject to the usual discount of 20 per cent. to the trade :

Lead Pipe	per lb.,	5¾ cents.
Sheet Lead	"	6¾ "
Tin-lined Lead Pipe	"	12½ "
Block Tin Pipe	"	30 "

Gas Pipe Stocks and Dies.—Owing to the active competition on Gas Pipe Stocks and Dies the market is not as steady and uniform as it has been, and in some cases manufacturers are quoting slightly lower prices.

Poultry Netting.—Competition between the manufacturers of Poultry Netting is decidedly active and present indications do not point to a stronger market in the near future. Many of the jobbing houses are booking orders from the retail trade covering their requirements for next season at prices substantially the same as ruled last season, though in some cases they are slightly lower.

Glass.—The demand for Glass in the East continues very light, owing largely to the mild weather. Glass has not been needed for closing in buildings in course of construction, as there has hardly been a night in which plaster would freeze. When settled cold weather arrives an increased demand is expected, when it will not be so much the price of Glass as obtaining it at any price. In fact, manufacturers' quotations are of little significance, as sales that are being made are at an advance on the discounts announced. Under the anomalous condition, it is not probable that the manufacturers will make any advance in prices at present. Each one is getting as large a price for the remainder of his product as possible. Animated by a corresponding spirit, New York jobbers advanced prices on November 12 to 60 per cent discount. They do not disguise the fact that the price is unnecessarily high, but ask it because they can get it. Chicago jobbers are expected to take similar action.

White Lead.—There has been merely fair business for the season. Neither dry Lead nor Lead in Oil was purchased in other than hand to mouth way. The demand has been of ordinary character also, with interest confined mostly to moderate quantities for early delivery, and prices remain without radical change.

Red Lead.—The movement of Red Lead has been only fair, yet probably up to the average for the late autumn period, and prices remain almost stationary.

Linseed Oil.—The price of seed has moved somewhat higher, and the market for Oil is naturally stronger, as neither the associated nor independent crushers can find enough margin of profit to provoke any unusual competition. The demand has been running rather light, however, and is only fair for this period of the year.

Old Rags, Paper, &c.—The market is quiet, but prices remain firm. Dealers are paying about the following rates for New York city delivery :

No. 1 White Rags	per lb.	2⅝ to 2¾c.
No. 2 White Rags	per lb.	1¾ to 1⅞c.
Mixed Rags	per lb.	1 c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1½c.
No. 2 White Book Shavings	per lb.	¾ to 1 c.
Light Book Shavings	per lb.	½ to ⅝c.
No. 1 Mixed Shavings	per lb.	¾ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1 c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to ⅝c.
No. 1 Manila Paper	per lb.	⅝ to ¾c.
No. 2 Manila Paper	per lb.	⅝ to ½c.
Bogus Paper	per lb.	⅜c.
Common Paper	per lb.	¼ to 3/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	½ to ¾c.
Hemp Twine	per lb.	1⅝ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	⅞ to 7/8c.

Old Rubber.—A fair demand is noted and prices show no quotable change. Local dealers are paying about the following figures :

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb	4 c.
White Syringes, per lb	4 c.

The Board of Managers of the Joint Traffic Association have fixed the standard time for fast trains between Chicago and New York at 26 hours and between St. Louis and New York at 30 hours. All trains making the run in less time will be considered as excess fare trains.

The hammer shops of the Cumberland Steel & Tin Plate Works, Cumberland, Md., recently burned, are to be rebuilt.

According to the *Post-Intelligencer* of Seattle, Wash., there is a likelihood of the erection in that city of a large plant for the manufacture of Tin Cans. Irving Ayers, treasurer of the Pacific Sheet Metal Works of San Francisco, Cal., was lately at Seattle investigating the advantages of locating such an industry there and laid a proposition for its establishment before the Seattle Chamber of Commerce. The object of the proposed Can factory would be to supply the Salem packers of Puget Sound. The Pacific Sheet Metal Works have for some time operated a Can factory at Astoria, Ore., and they have recently opened another at New Westminster, B. C. During the past season they shipped from Astoria to the Sound 9,000,000 Cans, besides supplying the Columbia River canneries In New Westminster the city gave the company exemption from all taxes for ten years. A Can making plant was also established by the same concern recently at Los Angeles, Cal.

General Wade Hampton, United States Commissioner of Railroads, has submitted to the Interior Department his annual report for the fiscal year ended June 30, 1897, which period, he says, marked the low water mark of railway construction in the United States. During the year 34 companies, with 5441 miles of road, passed into the hands of the courts, and 58 others, previously placed in receivership, were sold under foreclosure.

Henry L. Schwarzenberg, dealer in Scrap Iron and Metals, has removed his office to 407 Cuyahoga Building, Cleveland.

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Metal and Miscellaneous Prices.

CHICAGO, NOVEMBER 18, 1897.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
X, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
X, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
X, 14 x 56	21.00	$12.50
XX, 14 x 56	24.00	14.00
X, 14 x 60	23.00	13.50
XX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Celland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
$\frac{\text{I T P}}{\text{L}}$ Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.90¢	2.50¢
17 to 20	2.00¢	2.60¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ¥ lb, A	$10.20	10% dis.
Patent Planished, ¥ lb, B	9.20	
Craig's Polished Sheet Steel		8½¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ¥ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch.....36
Plain, ½ inch up to ⅝ inch.....38
Plain, ⅜ inch up to ½ inch.....41
Plain, 5-16 inch up to ⅜ inch.....08
Plain, ¼ inch up to 5-16 inch.....65
Plain, 3-16 inch up to ¼ inch.....1.00
Plain, ⅛ inch up to 3-16 inch.....1.50
Plain, 2 inch up to 3 inch.....38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots.....¥ lb, 40¢
100-lb lots.....¥ lb, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....¥ lb, 34¢
100-lb lots.....¥ lb, 33¢
Nickel Aluminum Casting Metal.
Small lots.....¥ lb, 39¢
100-lb lots.....¥ lb, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....¥ lb, 35¢
100-lb lots.....¥ lb, 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....¥ lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter.....¥ lb, 55¢
Aluminum Plates and Sheets, B. & S. gauge.
In lots of 50 lb or more. Less quantities, 5¢ ¥ lb additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	¥ lb	¥ lb	¥ lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Cutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax.....2.20 square
The Lloyd Spanish Tiling.....4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin.... ¥ square,	$4.75	$4.50
Galv.... ¥ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—
Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—
$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—
Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20.....8.00 square
Steel Painted, 14 x 20.....7.50 square

Cortright's Metal Slates—
14 x 20.....$5.25 square
10 x 14.....5.50 square
7 x 10.....6.50 square

Cortright's Victoria Shingles—
10 x 14.....$6.75 square
7 x 10.....8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....¥ lb 2 ¢
" " Brown.....¥ lb 1½¢
" " Purple.....¥ lb 2½¢
" " Ground in oil, B. Red, ¥ lb 6½¢
" " Ground in oil, Red. ¥ lb 6½¢
" " Ground in oil, Brown, ¥ lb 5½¢
" " Ground in oil, Purple, ¥ lb 6½¢
Linseed Oil, Boiled, in bbls.....37¢
Linseed Oil, Raw, in bbls.....35¢
Mineral Paints.....1 @ 3¢
Orange Mineral.....12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs, 3 to 6 ¢
Sipe's Japan Oil, in bbls., ¥ gal..... .34¢
Spirits Turpentine, in bbls., ¥ gal..34½¢
Asphaltum, Trinidad Refined, ¥ ton.$45
Tarred Felt, 1 Ply, ¥ 100 lb.....$1.25
Tarred Felt, 2 Ply, ¥ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ¥ roll 108 sq. feet.....$1.25
Roofing Pitch, ¥ bbl. of 300 lb... $3.00

NEW YORK, NOVEMBER 19.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than	6-in.	14-in.	24-in.
And including	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.42	.45
" 21 to 23	.42	.44	.47
" 24	.42	.46	.49
" 25	.43	.47	.50
" 26	.43	.50	.55
" 27	.44	.53	.58
" 28	.44	.53	.60
" 29	.45	.56	.65
" 30	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8½@8¾¢
Hallett's.....₩ lb, 7¾@8¢
Japanese.....₩ lb, 7½¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in	$0.35
⅝-in. up to ¾-in	.36
½-in. up to ⅝-in	.38
⅜-in. up to ½-in	.41
5-16-in. up to ⅜-in	.48
¼-in. up to 5-16-in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive	.38

35% off.

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—
Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Teruc.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2 00	2.30¢
Nos. 17 to 21	₩ lb, 2 10	2.40¢
Nos. 22 to 24	₩ lb, 2.20	2.50¢
Nos. 25 and 26	₩ lb, 2.30	2.60¢
No. 27	₩ lb, 2.40	2.70¢
No. 28	₩ lb, 2.50	2.80¢
American B. B		₩ lb, 4¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb, 8½¢

Galvanized.
Nos. 10 to 16.....₩ lb, 12¢
Nos. 17 to 21.....₩ lb, 13¢
Nos. 22 to 24.....₩ lb, 14¢
Nos. 25 to 26.....₩ lb, 15¢
No. 27.....₩ lb, 16¢
No. 28.....₩ lb, 17¢
No. 29.....₩ lb, 19¢
No. 30.....₩ lb, 21¢
75&10& 5% off.
36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4⅜¢
Bar.....5¢
Pipe.....5¾¢. 20%
Tin Lined Pipe.....12 ⅝¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6¾¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red hbls. and ⅓ hhls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American.....@1½¢
Red Venetian, American.....@1¾¢
Linseed Oil:
Raw, ₩ gal.....39@39½¢
Boiled.....41@41½¢
Spirits Turpentine:
In bbls.....33@33½¢
In cases.....41@41½¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5 ¢
Clarified.....₩ lb 4¾¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil*, ⅛c. ₩ lb *higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline.....₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
Wrought " American Unions.....40%
" " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....00%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&5%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Rauge Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....55%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated.....40&10%
Solid Bronze.....25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%

1896 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	1¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft.....1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.	₩ bbl.	$1.82@$1.83
Rosin, E. & F.	₩ bbl.	1.84@ 1.87
Rosin, G. & H.	₩ bbl.	1.90@ 1.95
Rosin, I. & K.	₩ bbl.	2.00@ 2.05
Rosin, M. & N.	₩ bbl.	2.10@ 2.25

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:
Best Bangor, ₩ sqr.....$3.75@$5.00
No. 1 Bangor Ribbon.....3.35@ 3.75
Pen Argyle, ₩ sqr.....3.75@ 4.35
Peach Bottom, ₩ sqr.....4.75@ 5.60
No. 1 Chapman, ₩ sqr....3.80@ 4.80
Lehigh Slates, ₩ sqr....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....$2.50@$3.55
Purple, ₩ sqr.....3.25@ 4.00
Unfading Green, ₩ sqr...3.75@ 4.50
Red, ₩ sqr.....9.00@11.00

Solder and Soldering Fluids— Solder—

½&⅓ guaranteed.....10¾@11¢
No. 1.....9¾@10½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
⅓ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb.....4¢
5% dis.

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....15½¢@17½¢ net

Spelter—

Western Spelter.....4.65@4¾¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15¼¢
Straits, pigs, lb lb.....14¾¢
Straits, in bars, ₩ lb.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	10¢
95 lb	15
90 lb	20¢
85 lb	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating	8.00 @ 9.25
STP Grade, 10 to 12 lb coating	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....$9.10
IXX, 14 x 28..(112 sheets).....9.80
IXX, 14 x 31..(112 sheets).....10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20	$5.00
" "	IX,	14 x 20	6.00
Allaway Grade,	IC,	14 x 20	4.25
" "	IX,	14 x 20	5.00

Coke Plates, Bright—

Steel Coke,	IC,	14 x 20	$4.25
	IX,	14 x 20	5.25

Terne Plates—

MF,	IC,	14 x 20	$6.25
		20 x 28	12.50
Worcester Grade,	IC,	14 x 20	4.25
		20 x 28	8.50
Dean Grade,	IC,	14 x 20	4.00
		20 x 28	8.00
Gilbertson's Old Method,	IC,	14 x 20	7.50
		20 x 28	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved pattern, ₩ doz...18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain	72%
1¼ and less, Galv	67%
1½ and larger, Plain	78%
1½ and larger, Galv	70%
Screw and Socket Joint Casing	65%
Inserted Joint Casing	60%
Boiler Tubes, 2¼ inch and smaller	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

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Kemp, C. M. Mfg. Co., Baltimore, Md.

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Crawford & Young, Boston, Mass.

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Rochester Stamping Works, Rochester, N. Y.

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National Pipe Bending Co., New Haven, Conn.

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Berger Bros., Philadelphia, Pa.
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Cincinnati Corrugating Co., Piqua, O.
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Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh Pa.
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Poorman Mfg. Co., Piqua, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

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Double Truss Cornice Brake Co., Buffalo, N. Y.
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Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Martin & Co., Pittsburgh, Pa.

Couplings. *(See Pipe Couplers.)*

Crimping Machines.
Packham Crimper Co., Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

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Berger Mfg. Co., Canton, O.
Cooney, Selner & Co., Indianapolis, Ind.

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Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Ct.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Berger Mfg. Co., Canton, O.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

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Eddy Electric Mfg. Co., Windsor, Conn.

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Eddy Electric Mfg. Co., Windsor, Conn.

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Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

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Connors, William, Troy, N. Y.

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Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Mt. Penn Stove Works, Reading, Pa.
Pease, J. F., Fce Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass
Schill Bros., Crestline, O.
Schwab & Sercomb, Milwaukee, Wis.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Stamford Foundry Co., Stamford, Ct.
Superior Fdry. Co., Little Falls, N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Turner Heater Co., Bristol, Ct.
Wheeler, Russel & Son, Utica, N. Y.

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Shepard, Sidney & Co., Buffalo, N. Y.

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Gregory, Thos. Galvanizing Works, Brooklyn, N. Y.

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Watrous & Co., Troy, N. Y.

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Howard Thermostat Co., Oswego, N. Y.
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Colwell Lead Co., 63 Centre St., N. Y.

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Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

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Huse, Jos. & Son, Boston, Mass.
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Eddy Electric Mfg Co., Windsor, Conn.

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Castle, Wilmot & Co., Rochester, N. Y.
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Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

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Wheeler, E. S. & Co., New Haven, Ct.

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Frink, I. P., 551 Pearl St., New York.

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Challenge Corn Planter Co., Grand Haven, Mich.

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Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

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Dixon, Jos. Crucible Co., Jersey City, N. J.
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Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

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Dwight Slate Machine Co., Hartford, Ct.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

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North Penn Iron Co., Phila., Pa.

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Mersick, C. S. & Co., New Haven, Conn.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Pocock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Mach. & Tool Co., Toledo, O.
Watrous & Co., Troy, N. Y.
West Mfg. Co., Buffalo, N .

Sheet Metal Work.
Willis Mfg. Co., Galesburg, Ill.

Sheets, Iron and Steel.
Apollo Iron & Steel Co., Pittsburgb, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgb, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N.Y.
Republic Iron Works, Pittsburgb, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelpbia Pa.

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Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugatiug Co., Piqua, Obio.
McClure & Co., Pittsburgb, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgb, Pa.
Taylor, N. & G. Co., Philadelphia Pa.
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Burden, W. J. & Co., Detroit, Mich.
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Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Sbingle Co., Camden, N. J.
Thorn Sbingle & Ornament Co., Philadelphia, Pa.

Shot.
Colwell Lead Co., 03 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Skylights.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.
Watrous & Co., Troy, N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgb, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelpbia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.
Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties Manufactured.
Burrows, F. S., 107 Beekman St., N. Y.

Stamped Ware.
Vogel, Wm. & Bros., Brooklyn, N. Y.

Statuary, Sheet Metal.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kielcy, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.
Schwerdtle & Siebert, Bridgeport, Ct.

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind.

Stove Linings.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Berger Bros., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.
Parks & Parks, Troy, N. Y.

Stove Putty.
Connors, Wm., Troy, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Clark, Henry N. Co., Boston, Mass.
Kieffer Bros., Syracuse, N. Y.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Morris, J. L., Chicago, Ill.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Mersick, C. S. & Co., New Haven, Ct.

Stoves and Ranges.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Buckwalter Stove Co., Royersford, Pa.
Bussey & McLeod Stove Co., Troy, N.Y.
Eclipse Stove Co., Mansfield, O.
Graff & Co., 208 Water St., N. Y.
Hess, Snyder & Co., Massillon, O.
Magee Furnace Co., Boston, Mass
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schill Bros., Crestline, O.
Sheppard, Isaac A. & Co., Phila., Pa.
Somerset Stove Foundry Co, Somerset, Mass.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., New York.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Calovit Heating Co., Brooklyn, N. Y.
Reincke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Ringen Stove Co., St. Louis, Mo.

Tea Kettles.
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Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Tea Pots.
Rochestor Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.
Berger, L. D., Philadelphia, Pa.
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Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tin Plate. (*Mfrs. of.*)
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelpbia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

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Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Tubing, Brass and Copper.
Randolph & Clowes, Waterbury, Conn.

Valves.
Eastwood Wire Mfg. Co., Belleville, N. J.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.
Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.
Littleford Bros., Cincinnati, O.
Marston, J. G. & Co., Boston, Mass.

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Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co, 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Zinc, Sheet.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

SEE ALPHABETICAL INDEX, PAGE 63.

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HELP WANTED.

A good TINSMITH, accustomed to roofing, spouting, plain piping, sheet irou and pump work; permanent position for the right man; none but sober and reliable men ueed apply. S. M. Lawrence, Cato, N. Y. Nov. 20

A Western manufacturer of furnaces and ranges, now located in New York, who works only the wholesale trade, wants an arrangement with a practical, live man with experience and ability to conduct the architect and building part of the trade; an equitable and profitable arrangement can be made to right man. "Western," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

By a large stove manufacturing house a SALESMAN to travel in Central aud Western New York, who is thoroughly well acquainted with the trade; give references, salary desired, &c. "A. B.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

A first-class TINNER; accustomed to all kinds of job work; must be able to do slate, lead and iron work; state wages. Jacob Schlosser, 207 Court street, Hamilton, Ohio. Nov. 20

SALESMAN to sell on commission enameled ware and cutlery as side lines; enameled ware sold from catalogue and pocket sample, cutlery from sample roll; state tcrritory or no attention. "Side Lines," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

To correspond with good CORNICE WORKERS and general workmen in sheet metal work. Write, stating experience, &c., Union Sheet Metal Works, 347-349-351 Central avenue, Los Angeles, Cal. Nov. 20

In small fouudry near Chicago, few experiencod MOLDERS on fine stove work; steady work. "Molders," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

A first-class SALESMAN to sell stoves in Peunsylvania; state agc, experience and salary expected. Address by mail W. S. Price, president G. Stove Compauy, Royersford, Pa. Nov. 13

One good TIN and GALVANIZED IRON WORKER; married man preferred; man who can get out aud put up a job of coruice, or do a shaving pipe job; steady work to a general workman. Apply to 68 West Main street, Lexington, Ky. Nov. 13

COPPERSMITH.—Man familiar with manufacture of range boilers or similar work. Address, stating references, age, married or siugle, where last employed, together with experience; replies confidential if so desired. "Coppersmith," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

Practical FURNACEMAN who has had experience on the road to sell furnaces and boilers in Wisconsin and Miunesota; one who understands steam and hot water heatiug prefcrred. "Furnace Man," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Nov. 13

An experienced SALESMAN to travel for a manufacturer of boilers and furnaces in Illinois and Iowa; must understand warm air, steam and hot water heating "Experience," offiec of *The Metal Worker*, 59 Dearborn streot, Chicago, Ill. Nov. 13

A Connecticut house wants a young mau familiar with plumbiug goods and prices as ASSISTANT BOOKKEEPER and to aid in selling and estimating; stato experience, age aud reference. "Klondike," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

A good TINSMITH and JOBBER to come aud locate in a live New England town. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Oct. 9

SITUATIONS WANTED.

PLUMBER, young man 26 years of age, wishes to obtain steady place in New York or vicinity; nine years' experience in lead and iron pipe work, gas and low pressure steam heating; understands plans and rules of Board of Health; will work for reasonable wages. "Plumber," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

With some good house as a SALESMAN; 15 years' experience in hardware, tin and stoves; can speak German and English. "German," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

As FOUNDRYMAN; ten years' experience on extra finish and plain hollow ware, eight years' on all kinds of machinery and job molding, and two years' on stove plate. Henry Gack, Sidney, Ohio. Nov. 20

Steady work on stove and furnace patterns by an experienced iron stove PATTERN FITTER. Frank Hamburger, 23 Earl place, Buffalo, N. Y. Nov. 20

By a BRASS MOLDER; 15 years' experience on plumbing supplies and steam work; capable of taking charge; first-class references; city or country. Dauiel Norman, 214 South street, Boston, Mass. Nov. 20

By a sober, reliable man as a general all round helper for hardware, stoves, tinware or ordinary tinning; small wages for steady work "J. H. B.," Box 315, Walkerton, Ind. Nov. 20

By a young man as PLUMBER and GAS FITTER; 12 years' experience in city and country; strictly temperate; steady position desired. "F. S.," Saratoga Springs, N. Y. Nov. 20

BOOKKEEPER, CREDIT and COLLECTION MAN of 14 years' experience with one firm is open for engagement; possessing energy, business abilities and references of the highest character. "Punctuality," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

As BUSINESS MANAGER or SALES MANAGER; thoroughly understands the stove business in all departmonts; first-class references given; employed at present, but desires to make a change. "Duplex," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

By a first-class PATTERN FITTER with a first-class stove works as foreman; can take full charge of pattern or mounting shop; best of refcrences. "S.," No. 1120, office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

By a first-class TIN and SHEET IRON WORKER for in and outside work; experienced in mill work, blow pipe, vontilating, furnace and range work, roofiug, &c.; can draw own patterns; 28 years of age; married; sober and reliable. M. Bloom, 106 East Broadway, New York City. Nov. 20

By a young man who has had six years' experience at plumbing, gas, steam and hot water fitting, also roofing, guttering, spouting, range, furnace and iron pump work; would like steady job; New York or New England States preferred. J. H. Healey, 19 Water street, Ansonia, Conn. Nov. 20

By TIN and SHEET METAL WORKER; good workman; situation in factory or shop on inside work; all round experience, 15 years in English factorics, 15 years in this country; large experience in weather vanes and copper finials; accustomed to work from drawings. Wm. Thomas, P O. Box 420, Peterboro, N. H. Nov. 20

American, 40, with several years' experience as a salesman, local and traveliug, and manager of a corporatiou's business in this city, well acquainted with jobbers and retailers of hardware, stoves, tin, &c., throughout the Middle and Eastern States, is open for engagement as MANAGER of branch house or to fill similar position; not averse to representing good house on commission basis with exclusive territory; A1 credentials. "Busiuess Developer," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

SALESMAN would like to engage for the year 1898 to represent a line of hardware specialties, tinware, tinners' supplies, &c., on the road; salary or commission. Box 146, Morrison, Ill. Nov. 20

Steady position by a PLUMBER and GAS FITTER; first-class workman; ten years' reference from last employer. "A. O. M.," 13 Valley street, Worccster, Mass. Nov. 20

Steady position by a young man, singlc, sober and steady, who is a good general jobber at tinning, plumbing and iron pipe work; ten years' experience; city or country. Jos. Brooks, 160 Walnut street, Bloomfield, N. J. Nov. 20

By practical CORNICE MAKER, TINNER and FURNACE MAN; good cutter and capable of taking charge of shop; 15 years at trade and five years' business experience; married and sober; desires position in Central States. "A. B. C.," 288 South Lake street, Aurora, Ill Nov. 20

STOVE PATTERN MAKER, artistic carver and designer, with 20 years' oxperience, wants to make an engagement with some stove foundry in altering and redressing the wood patterns up to the present time; will give refereuces and photos of his abillity in getting up new work. "Expert," Troy Artistic Stove Pattern Works, 458 River street, Troy, N. Y. Nov. 20

Hardware and stove SALESMAN with exceptional references desires change; West preferred. "L. V. C.," care Messenger Hotel, Port Huron, Mich. Nov. 20

Young man, 22 years of age, competent DRAFTSMAN, six years' experience in all lines of drafting, mostly architectural, also having office experience, desires a position of any kind; salary, $10 per week, with chance for advancement; good reference. "W. B.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

An experienced and practical foundryman, particularly in the specialties of stove plate, furnace and core work incident to steam and hot water heaters, would like to correspond with a first-class manufacturer desiring to engage the services of a FOREMAN or SUPERINTENDENT of a foundry; has served several years in such capacity, but has good reasons for seeking a change; is familiar with cupola practice and core making and core work; could command a good corps of molders skilled in the specialties referred to; could onter upon service January 1 or possibly earlier; would be able to furnish satisfactory references. Address "Foundryman," 55 East Newton street, Boston, Mass. Nov. 20

By a sober and reliable PLUMBER, HOT WATER and GASFITTER; good reference furnished. Box 93, Naples, Ontario County, N. Y. Nov. 20

By a TIN and SHEET IRON WORKER who understands tin roofing, spouting, pump work and general jobbing done in a country shop; also kitchen boiler connection and iron pipe work. "S. G.," 122 Highland avenue, Buffalo, N. Y. Nov. 20

As PATTERN CUTTER in job, veutilating or blow pipe shop by a man of extended experience; cuts by triangulation. "A. E. H.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

Steady employment by a strictly first-class PLUMBER; also understands steam and hot water heating. "W. D. C.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

By first-class FURNACEMAN and GENERAL TINSMITH; 20 years' experience; strictly sober man. "Furnaceman," 128 Hamilton street, Cleveland, Ohio. Nov. 13

By TIN and SHEET IRON WORKER; eight years' experience; city or country; can do roofing, heater, range, leader and gutter work and general jobbing; not afraid of work, and strictly sober. Harry Wolfson, 73 East 106th street, New York City. Nov. 13

After January 1 to represent west of Chicago a hardware, tinware, stove or furnace house; well posted in all the lines. "Well Posted," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

An experienced FOREMAN, good draftsman and accurate and rapid estimator will be at liberty January 1, 1898, and desires to correspond with cornice and skylight concerns in need of such a man; if necessary, could leave present placo sooner; satisfactory reasons for changing. "Push," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

By a SOLDERER with over 15 years' experience; can also work at steam fitting, run drill press, &c.; would work for $7 a week for a steady job; has reference. "J. M. T.," care M. E. Ross, 301 Sixth street, Brooklyn, N. Y. Nov. 13

By a TINNER; young man with 14 years' experience at general job work, roofiug and guttering; would like to make contract first of the year; strictly sober and reliable; reference; will work reasonable. Box 207, Harrodsburg, Ky. Nov. 13

By first-class PLUMBER; can work from plans and specifications; 15 years' experience; city or country. "Cruet," 74 Washington street, Flushing, N. Y. Nov. 13

For 1898, by man with established trade in Ohio in tin plates, metals and tiuners' stock; also acquainted with the stove and house furnishing goods trade. "F.," care 135 South Front street, Columbus, Ohio. Nov. 13

An experienced stovc, furnace and gasoline stove SALESMAN, with established trade in Indiana, Michigan and Ohio, would like to correspond with some good concern relative to the season of '98 "Buckeye," offico of *The Metal Worker*, 232-238 William street, New York City. Nov. 13

To represent some good stove manufacturing company or some line that will interest the retail hardware trade in Ohio, Maryland and Illinois; seven years' experience in those States for one among the best of stove manufacturers; unquestionable references. A. H. Reist, 594 West Fifth street, Dayton, Ohio. Nov. 6

A1 PLUMBER, STEAM and HOT WATER FITTER wants a steady position; can furnish three years' referenco from last employer. "Harsin," 961 Sixth avenue, New York City. Nov. 13

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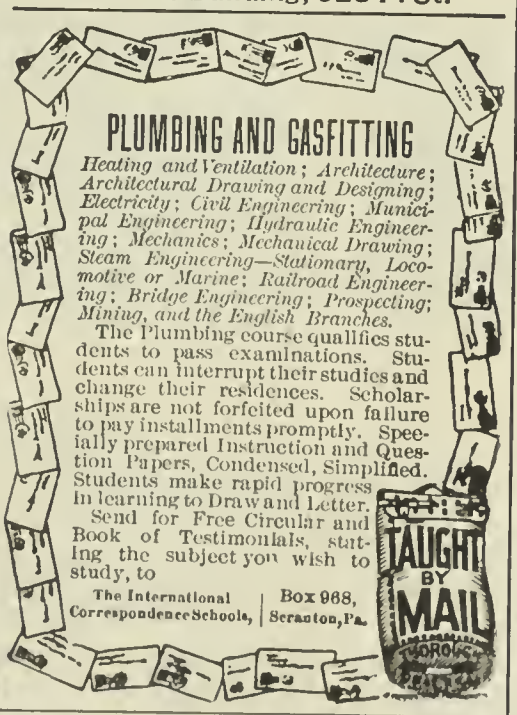
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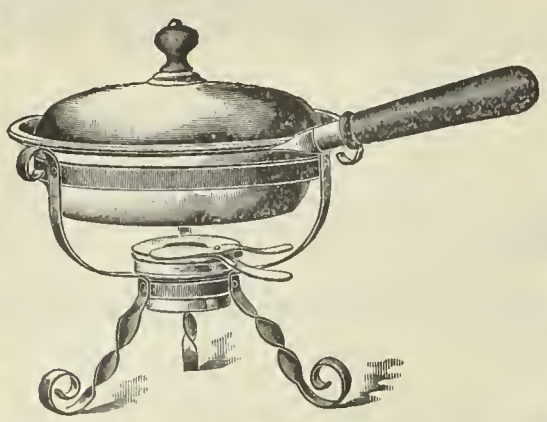

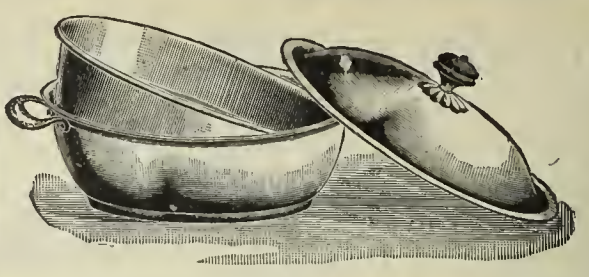

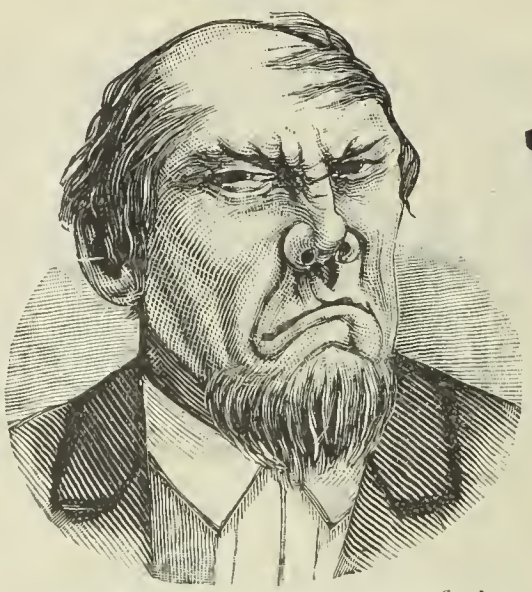

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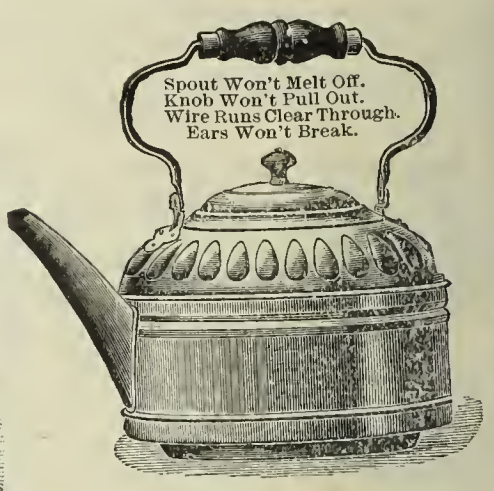

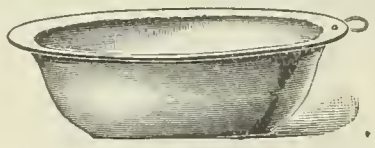

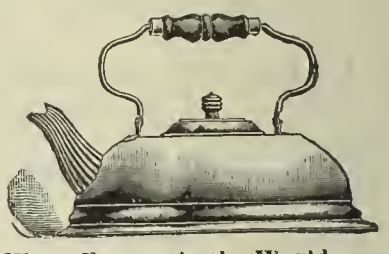

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Pillars for Displaying Goods.
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Iron and Steel.

THIS volume has been compiled from the extended series of articles in *The Iron Age*, on the arrangement of Hardware Stores, and contains a large and varied mass of information in regard to store arrangement.

A chapter is devoted to each subject and all are fully illustrated.

The summary of contents will convey an idea of the wide scope of the work, which treats of almost every subject connected with the arrangement of Hardware Stores.

Every hardware merchant should have a copy.

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A complete outfit for working Sheet Metal Pipes.

Cuts Stove, Heater or Leader Pipes at any angle. Will also do the Crimping.

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Ask your dealer for them or write for circulars and prices.

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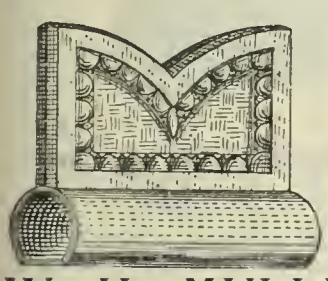

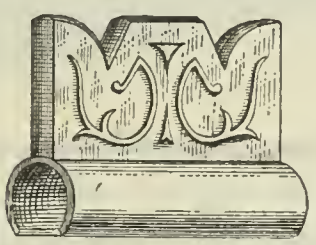

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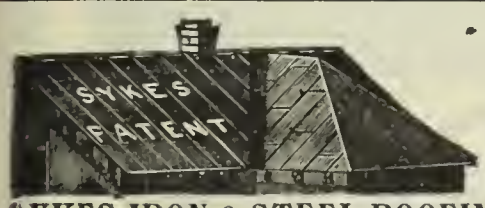

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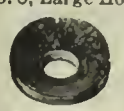

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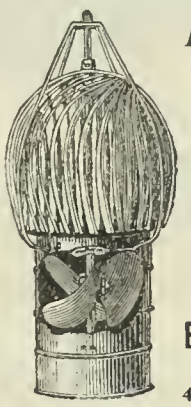

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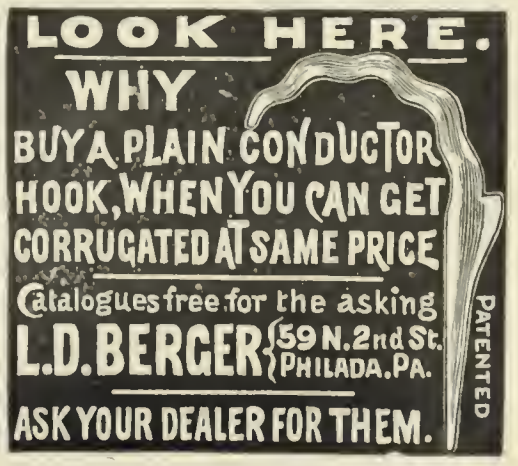

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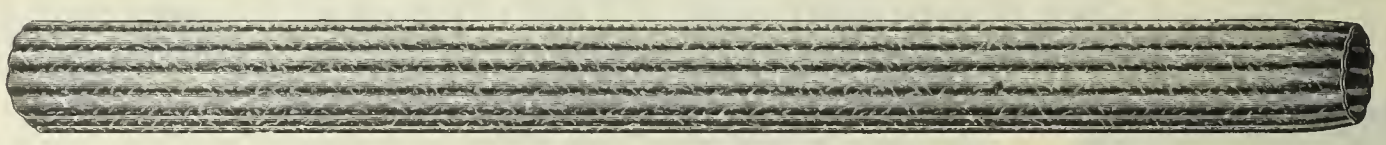

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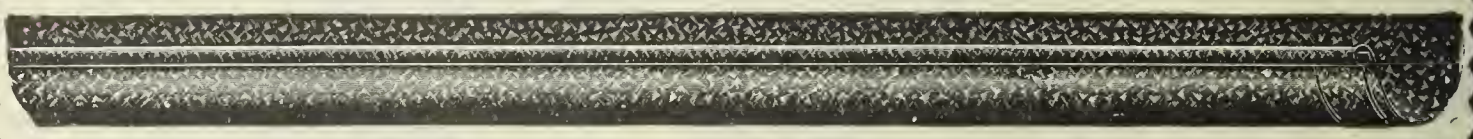

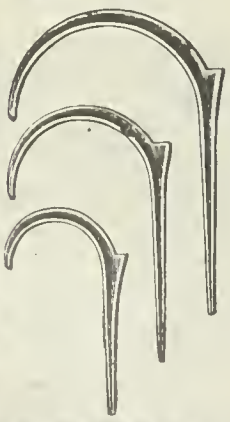

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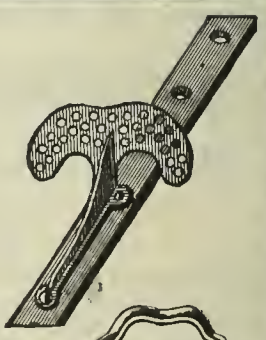

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COKE TIN.
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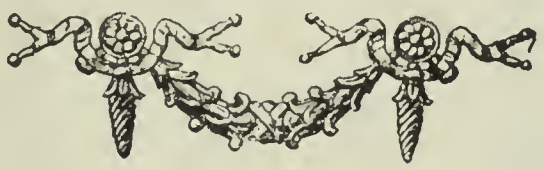

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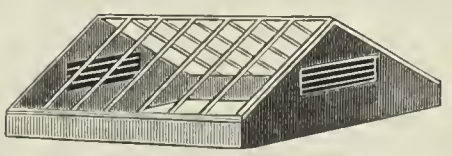

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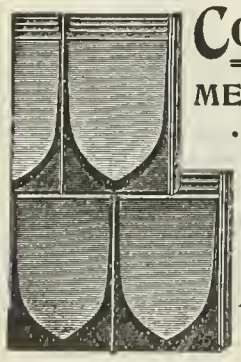

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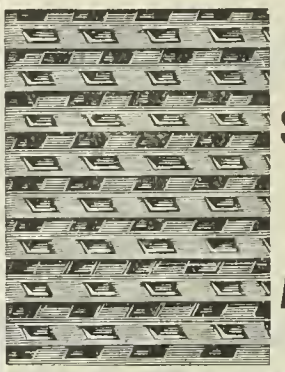

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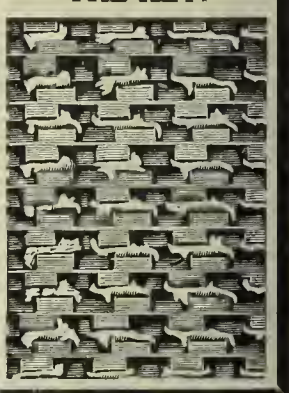

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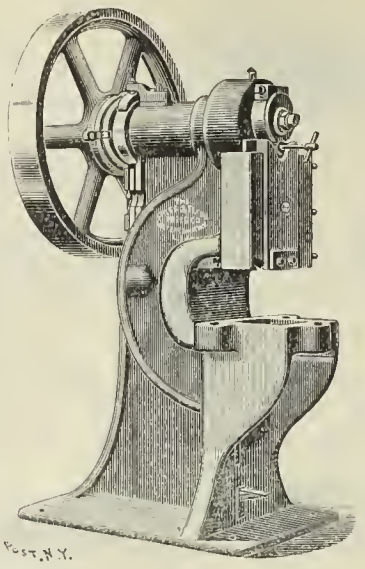

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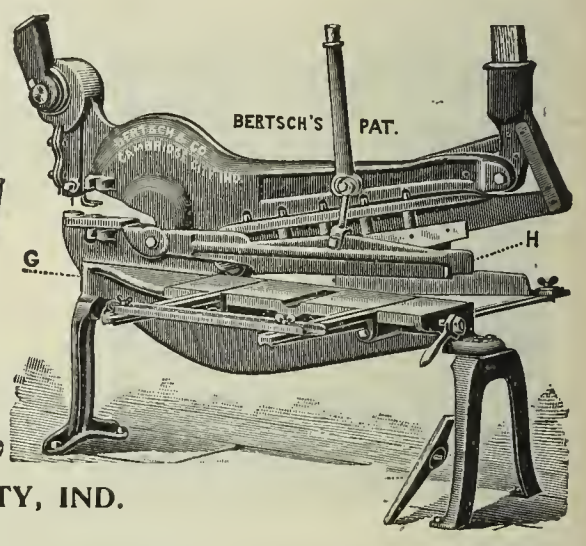

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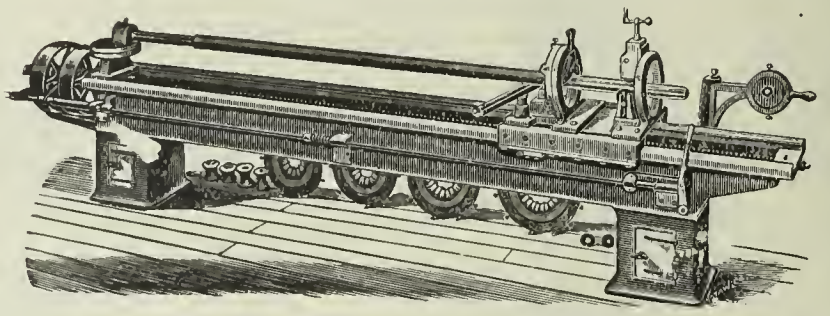

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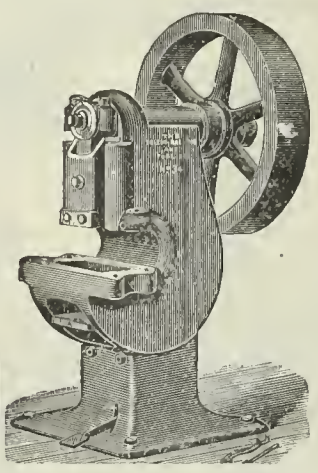

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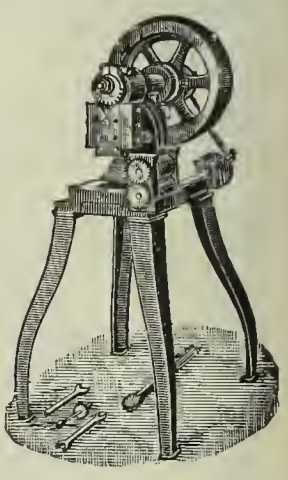

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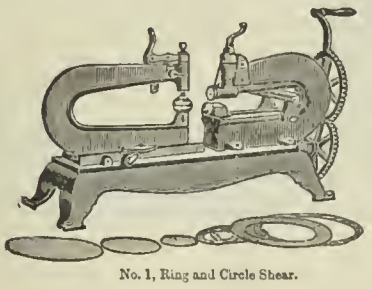

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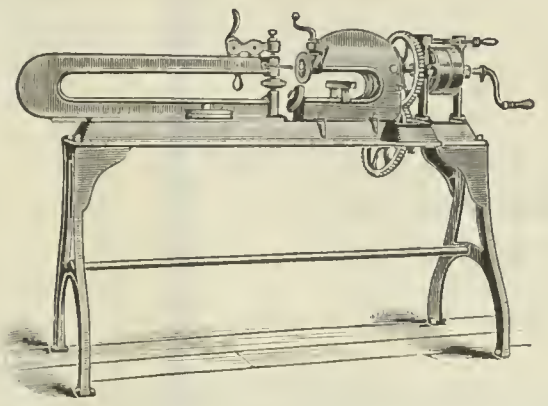

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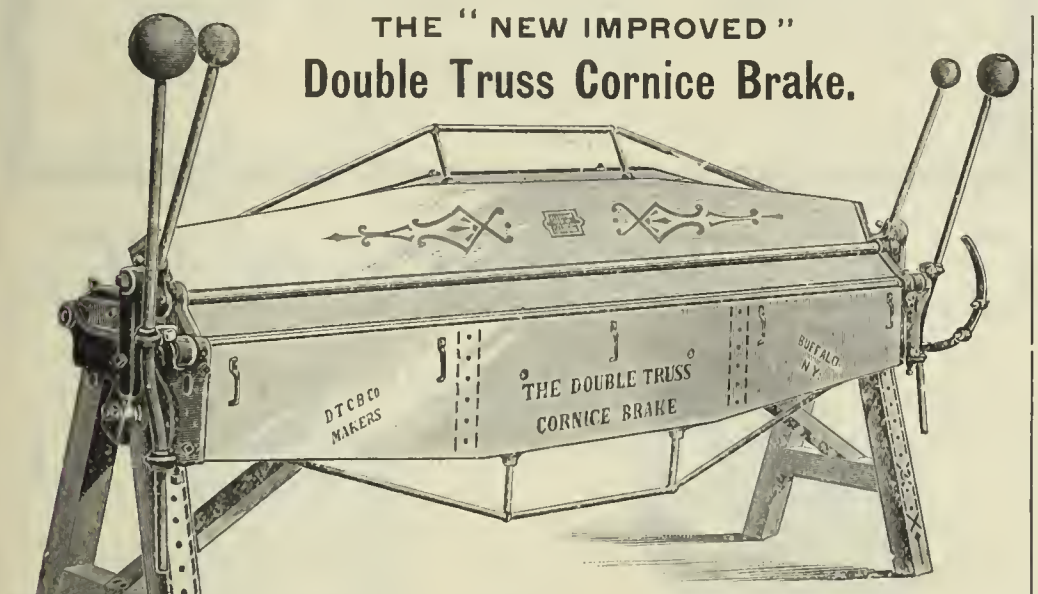

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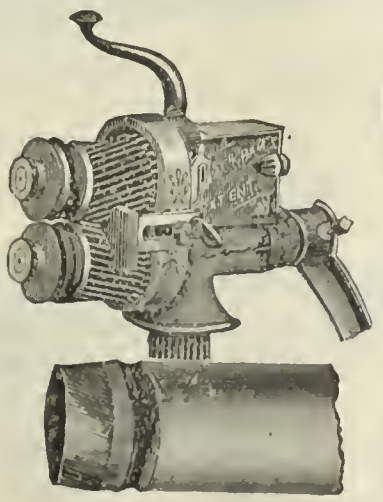

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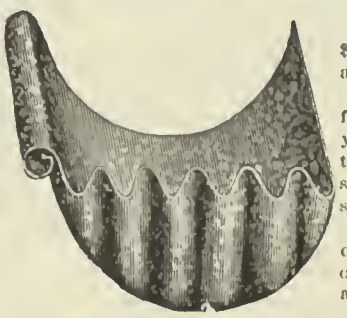

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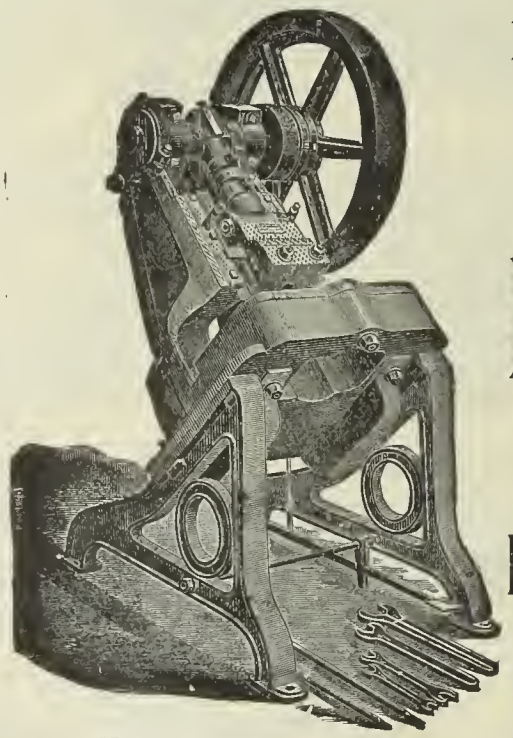

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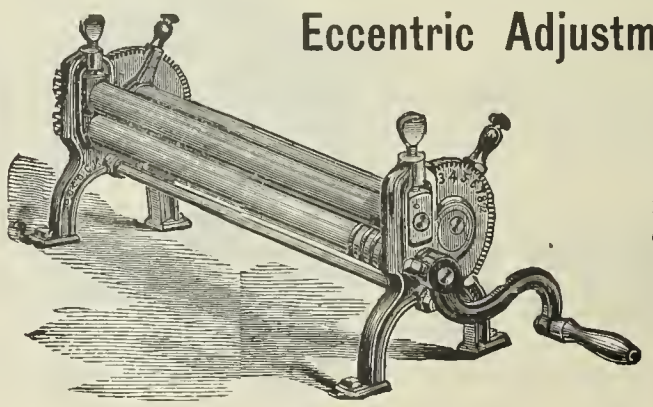

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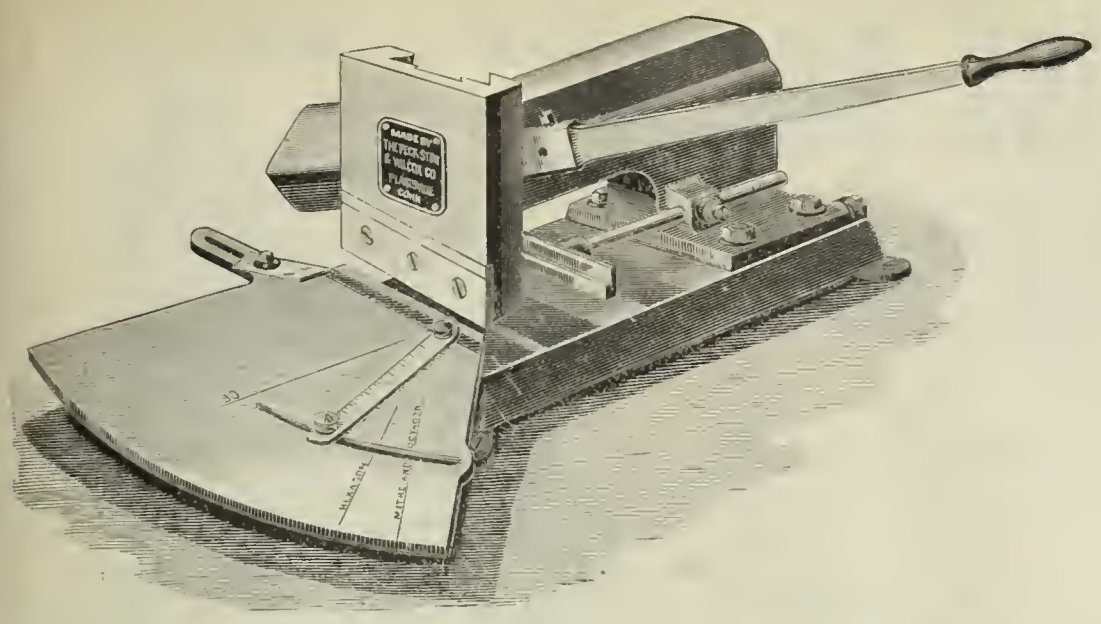

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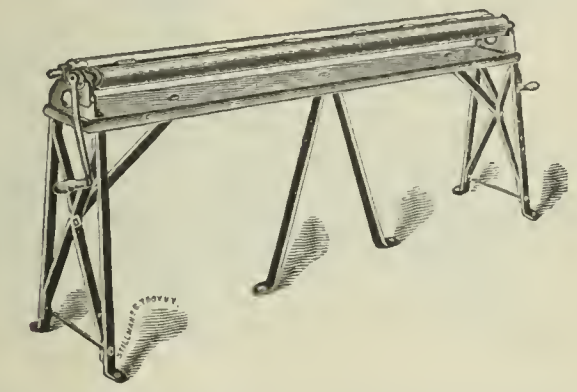

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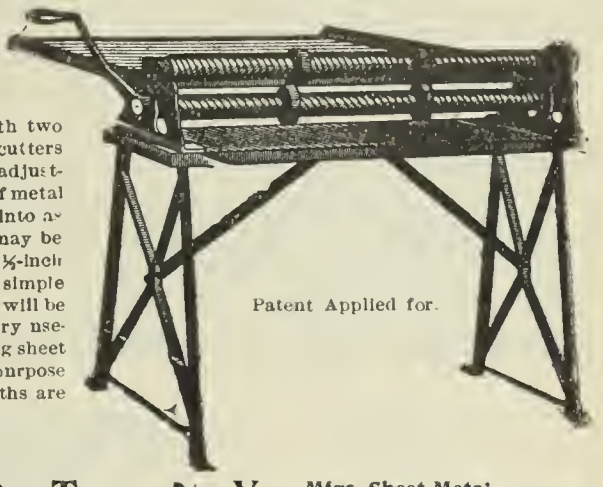

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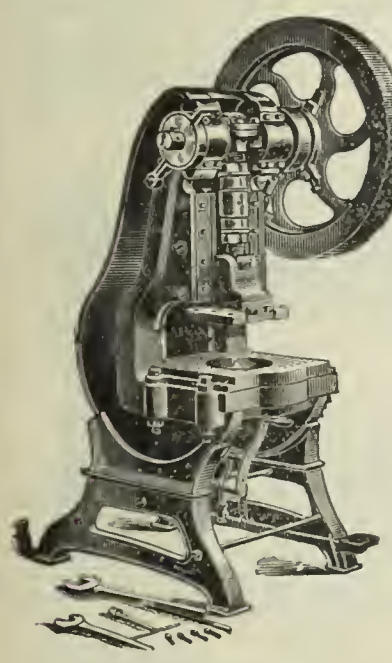

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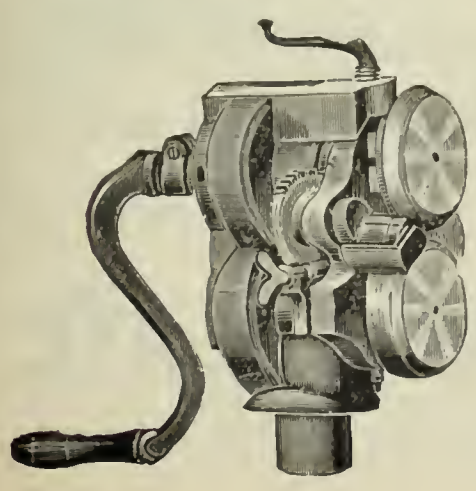

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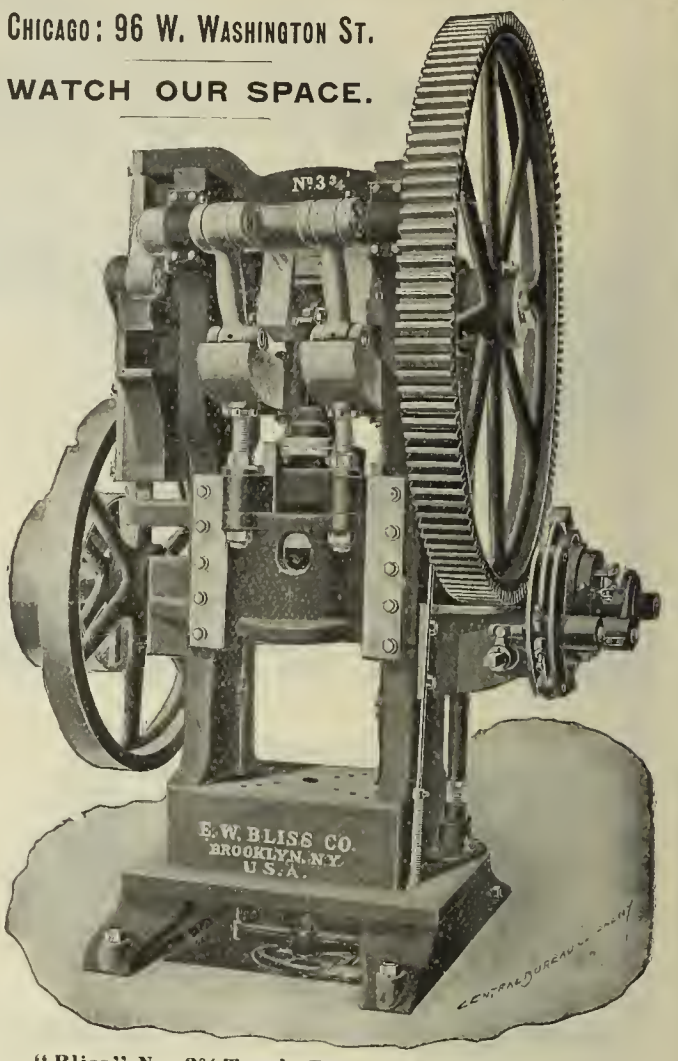

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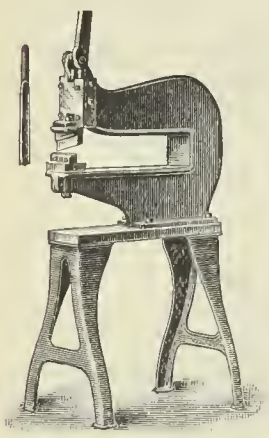

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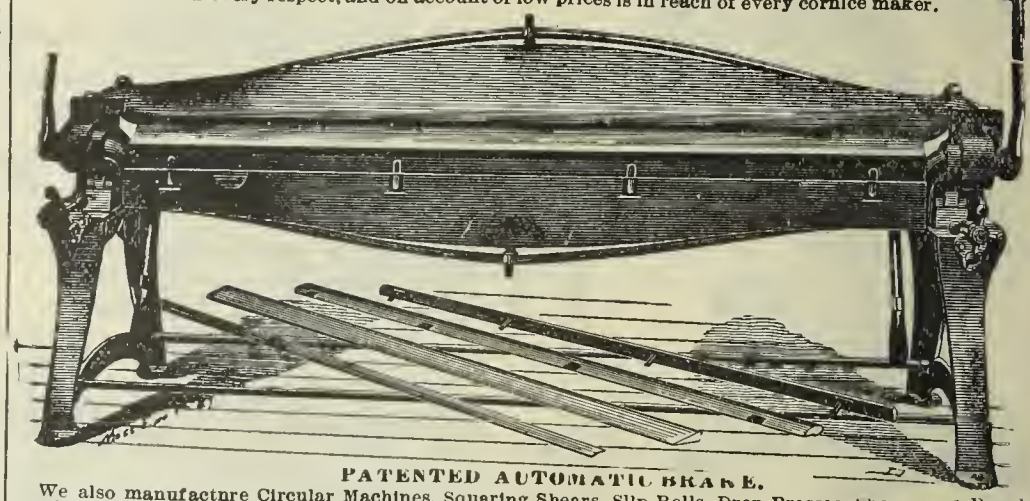

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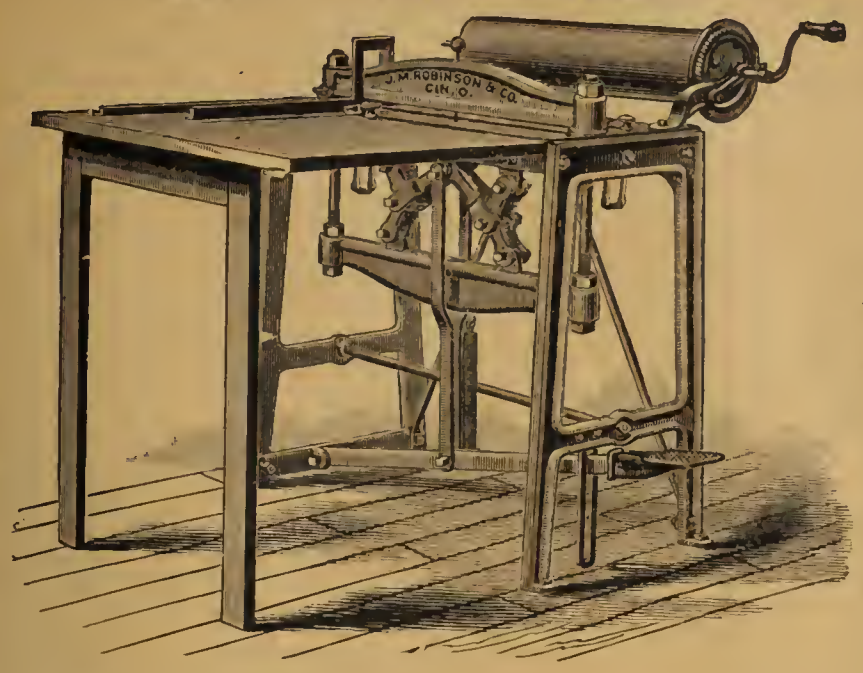

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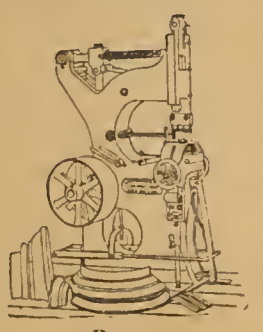

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Sheet Metal Working Machinery of all Kinds.

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PATENT AUTOMATIC CAN BODY
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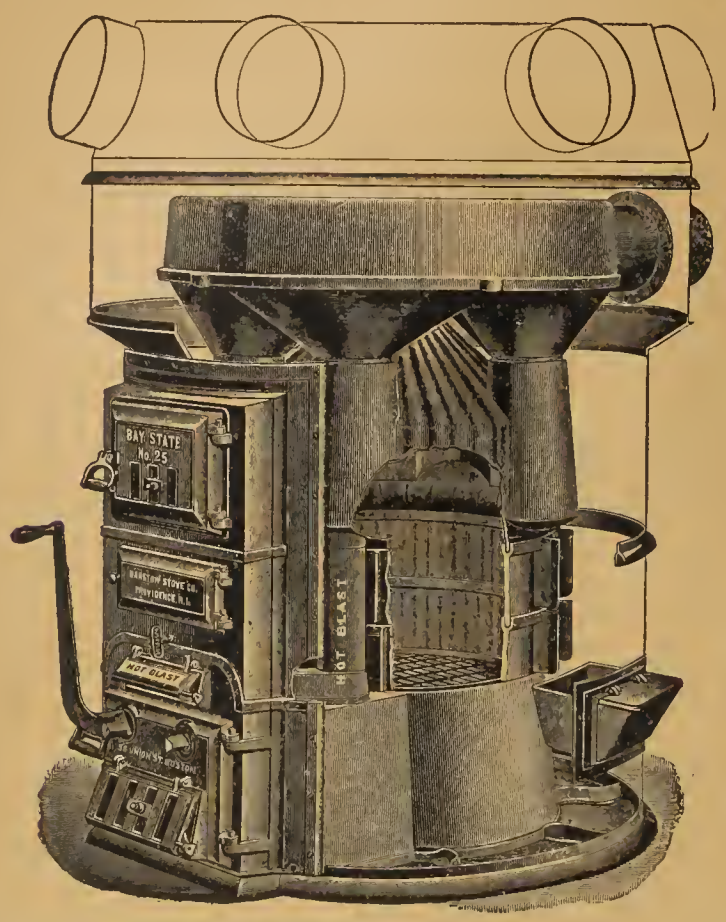

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BARSTOW STOVE COMPANY,

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N. & G. TAYLOR CO.'S
OLD STYLE brand
Roofing Tin
On
THE WHITE HOUSE,
Washington, D. C.

The wear is the true test of value.

This brand of Tin was selected by the U. S. Government over all Competitors.

The trade will recall that another brand was used for this roof only a few years ago.

N. & G. TAYLOR CO.
SOLE MANUFACTURERS, PHILADELPHIA.

The Great CHURCH LIGHT
Frink's Patent Reflectors for Gas, Oil or Electric, give the most powerful, softest, cheapest and best light known for Churches, Stores Banks, Theatres, Depots, &c. New and elegant designs. Send size of room. Get circular and estimate. A liberal discount to churches and the trade *Don't be deceived by cheap imitations.* I. P. FRINK, 551 Pearl St., N. Y.

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Bullitt Building, Philadelphia.

Dunbar Foundry and Forge Irons.
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Allentown Iron Co.
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Dealers in all kinds of Scrap Iron and Steel.

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TINNERS'
TOOLS and MACHINE
TINNERS'
SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street.
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UTICA PIPE FOUNDRY CO.

CAST IRON PIPE and SPECIALS for WATER and GAS. Also Flan Pipe and Fittings, Hydrants, Gates, Pig Lead, etc. CHAS. MILLAR & SON, Selling Agen Utica, N. Y. Manufacturers of Lead Pipe and Plumbers' Materials. Wholesale East Agents Akron Vitrified Sewer Pipe

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W. Dewees Wood Co. *McKeesport, Pa.*
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Good Judgment

and Common Sense in a large degree is displayed by the stove dealer who refuses to deal in varieties and job lots, but wisely decides that whatever of money or talent he may have, it shall be expended to further the sale of ONE good reliable line, one sure to bring future business.

That man should handle the

GLENWOOD.

Write the Weir Stove Co., Taunton, Mass.

McClure's Re-dipped
Brand of **Roofing Tin.**

American Made. Guaranteed Superior Quality.

McCLURE & CO.,

TIN PLATE AND METALS.

PHILADELPHIA, 115 North 7th St. PITTSBURG, PA. 211—213—215 Second Ave.

Index to Reading Matter, Page 57.

Index to Advertisements, Pages 60 - 62.

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

XLVIII. } NEW YORK AND CHICAGO, NOVEMBER 27, 1897. { ONE DOLLAR A YEAR.
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FLUSH & SUPPLY PIPES. BASIN
LAVATORY LEGS AND BRACKETS. AND BATH
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WILL BURN HARD OR SOFT COAL.

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Stove Putty

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GALVANIZED IRON.

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We furnish these tested to 200 pounds and guaranteed against collapse, and for use under heavy pressure. They cost a little more than iron, but are not only more durable but have a value as old copper which is a handsome percentage of cost.

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Manufacturers of FIRE BRICK LININGS.

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ump Governors, Noiseless Back
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team and Water Water Arches,
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ank Temperature Controller.

KIELEY, 9-17 W. 13th St., NEW YORK.

JENKINS AUTOMATIC AIR VALVES

with Drip-pipe Connections insure perfect circulation. You are not annoyed with escaping steam or dripping of water. They are stamped with our Trade-Mark.

JENKINS BROTHERS,

New York, Boston, Chicago, Philadelphia.

SEE THE MAGEE Advertisement PAGE 15.

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STEEL RANGE.

The name tells the story of its convenience.

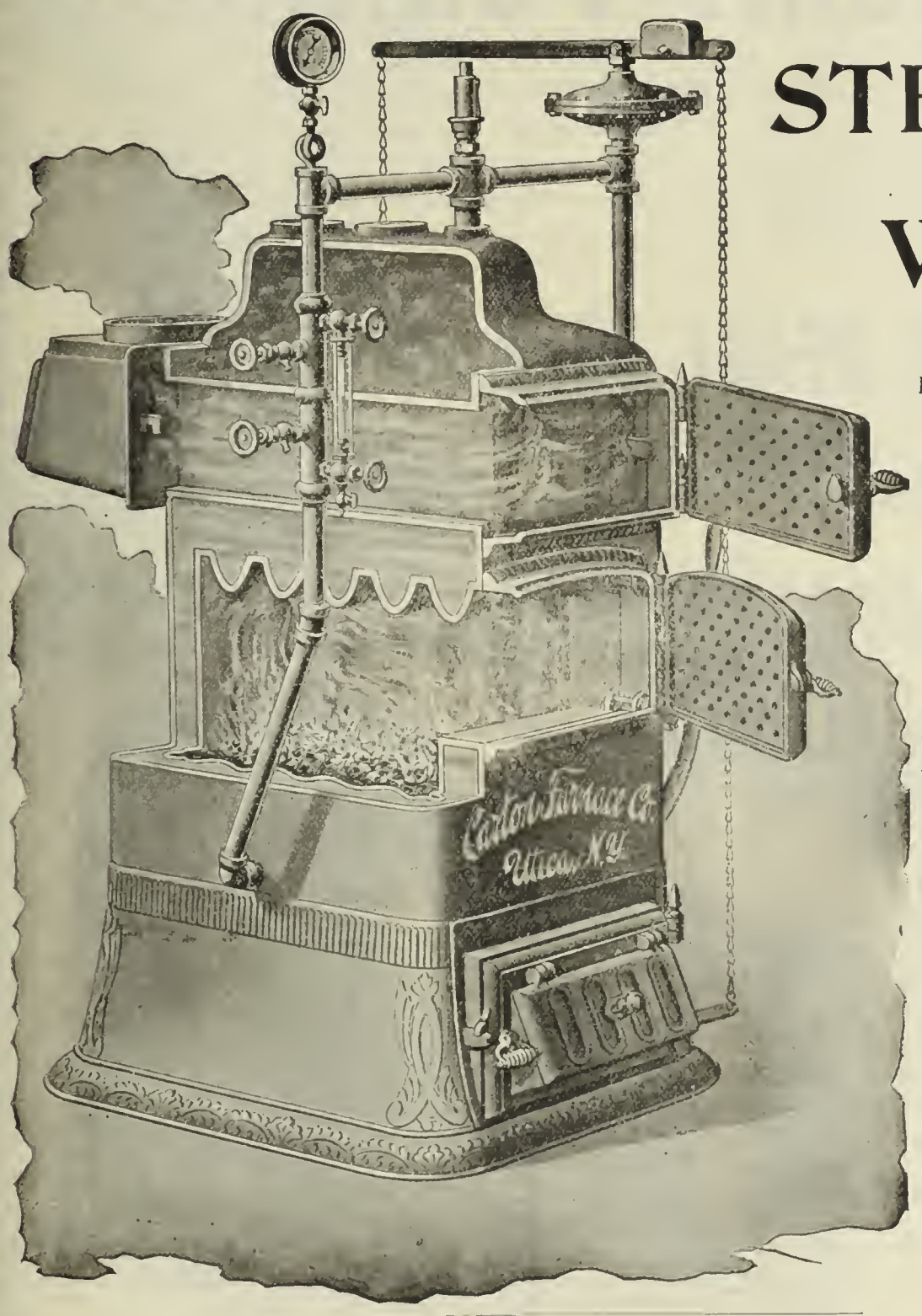
When we began manufacturing the Quick Meal Steel Range, we had foremost in our minds to make it the "Dealers' Range." A range that would satisfy and meet every demand made upon the dealer. A range in which the dealers' interest would be identical with our own. We know our efforts in this direction have been appreciated. Valuable suggestions have come from dealers and credit is due them for their assistance in perfecting the "Quick Meal." Every suggestion has been carefully considered; every detail, however small, closely examined; every part thoroughly tested. The result is that many of our dealers tell us the "Quick Meal" Steel Range is equal to the best, while the rest say, it is much better than the best.

"That's What They Are."

RINGEN STOVE Co. SAINT LOUIS

Carton

Hot Water & Steam Boilers & Furnaces.



FOR

STEAM

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WATER.

Notice the

Crown Sheet

with large

Fire Surface,

a feature of this Heater.

Made in 2 PIECES with
LOCK NUT
Nipple Connections.

All Vertical Circulation.

Send for our GOLDEN JUBILEE Anniversary BOILER CATALOGUE,

1847-1897.

If Interested in Hot Air Furnaces, we make a most complete line, and you should send for our New Furnace Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *50 Years,*

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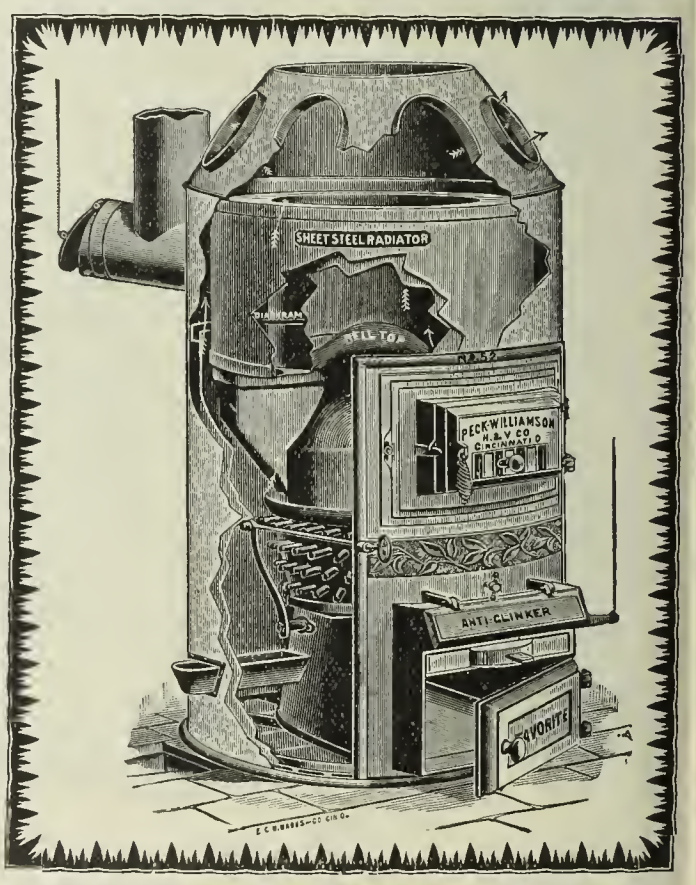
Are MAGNIFICENT Heaters, Extraordinarily ECONOMICAL, Wonderfully DURABLE, Perfectly GAS AND DUST TIGHT. Their superior qualities have made them very popular with the dealers, for they never fail to please the customer. Dealers who sell them increase their profits, add to their own reputation. Send us your inquiry and we will send you catalogue illustrating a large and varied line of furnaces.

J. F. PEASE FURNACE CO.,

Manufacturers of COMBINATION HEATERS and STEAM AND WATER HEATERS,

86 East Lake St., Chicago. SYRACUSE, N. Y.

Without a Defect



The Favorite Furnaces are so recognized and endorsed everywhere because ***they are***. Our agents have never had to take one out or substitute another make. They are constructed on honor, and to use them is to attain that satisfaction in a heating apparatus so essential but difficult to obtain. Can't you place one or more in your vicinity? We ship same day order is received. There's money in it for you, Dealer.

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Save Your Coal. Save Your Coal.

RUSSEL WHEELER & SON
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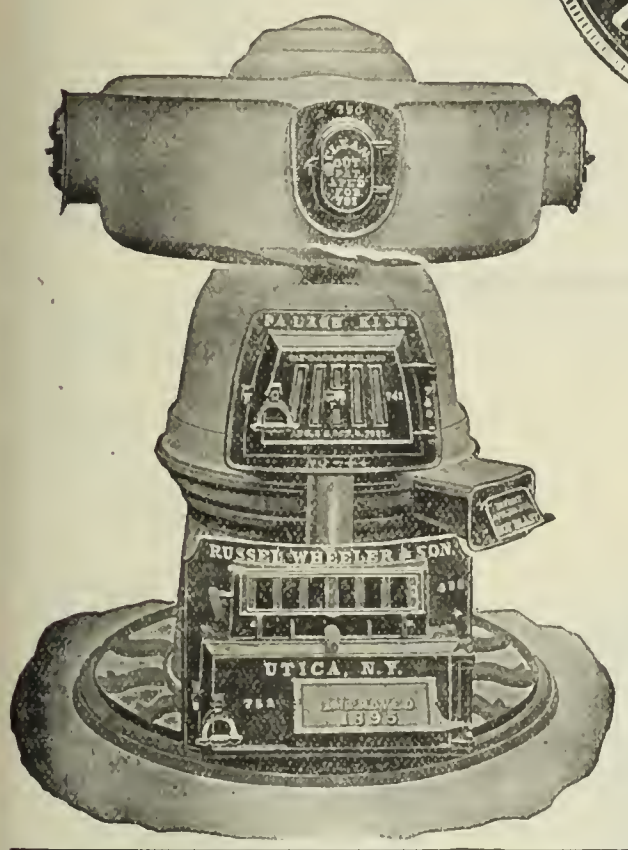
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.



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SAVE YOUR COAL.

You can Save Coal, and Money too, by using our Heaters.

THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
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HATBORO, PA., Dec. 26th, 1896.

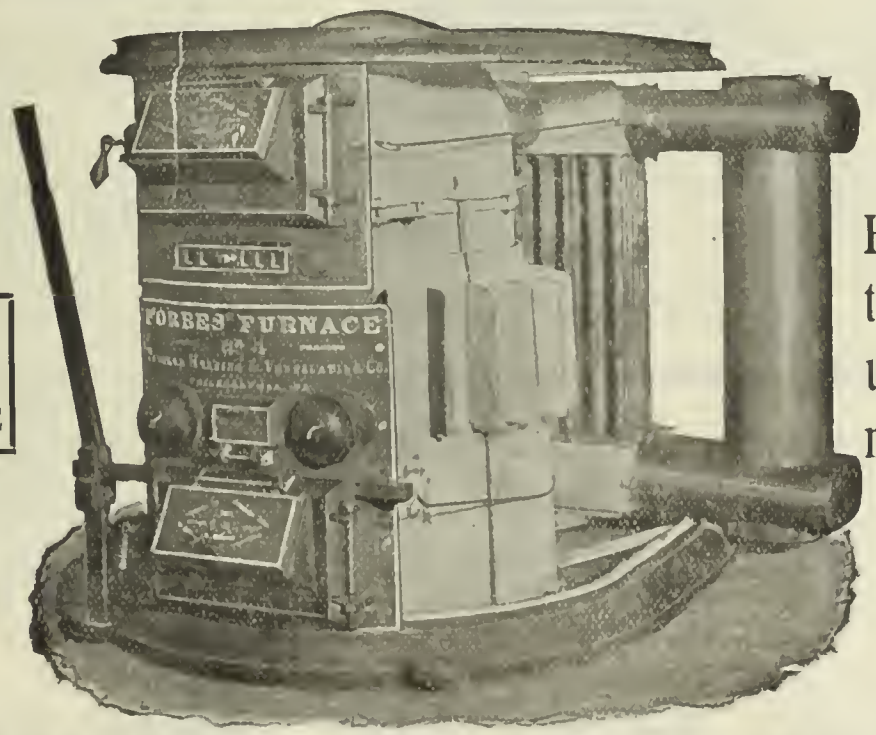
MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.

MY DEAR SIR:

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal

Very truly,
I. N. EVANS.

SEND FOR CATALOGUE



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Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

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Just Compare This

WITH THE HIGH PRICED
GOODS YOU HAVE BEEN
OFFERED AND THEN

WRITE US FOR PRICES.

WE WILL SHOW
YOU THAT A
STOVE IS MADE
WHICH APPEARS
MASSIVE
AND HANDSOME
AND
COMPARES
FAVORABLY WITH
HIGH PRICED
GOODS
AND YET IS CHEAP
AND
PROFITABLE.

THE PENN OPAL.

THE PENN OPAL
IS A VERY CHEAP,
BEAUTIFUL
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STRAIGHT DRAFT
AND FULL
REVERTIBLE FLUE,
MODERN
PARLOR STOVE
ON WHICH YOU CAN
MAKE A GOOD
MARGIN,
AND WHICH WILL
SELL READILY.

A FEW of these stoves on your floor will convince your trade that you have goods up to the times in every respect. We make them in four sizes and two styles, and have a descriptive pamphlet ready to mail to you upon request.

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ROYAL HEATERS.

All Kinds of Heating Apparatus.

UTICA, N. Y.

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Royal Heaters Lead All Others.

Sold on their Merits, not on their Antiquity.

Built for the most critical trade—the

Grand Apollo.

Solidly Heavy,
Large Flues,
Scientific Fire Box,
Oven Indicator,
Detachable Reservoir,
Polished Nickel Edges.

"THE PEER OF ANY IN THE EAST."

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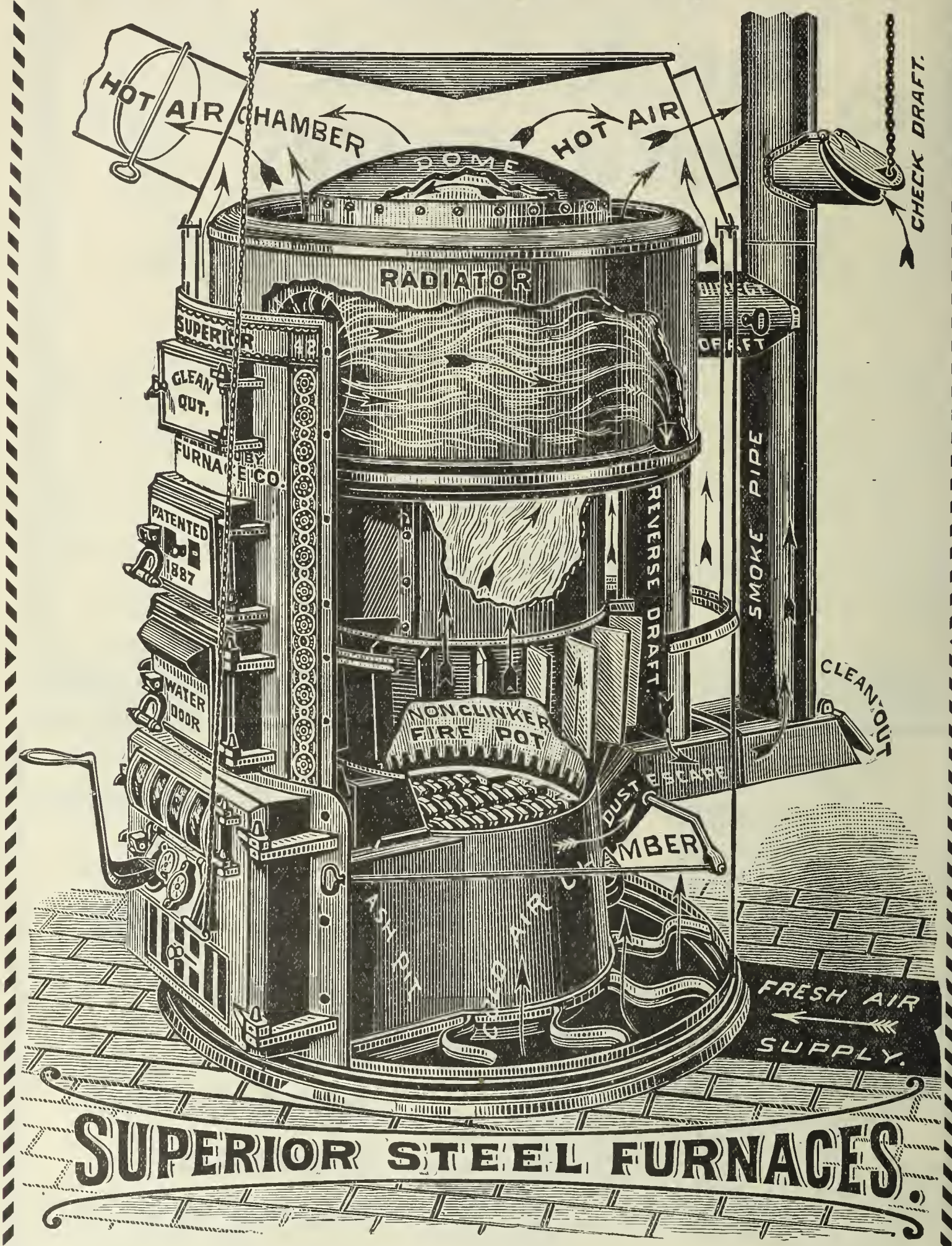
BUCKWALTER STOVE CO., - Royersford, Pa.

BUY THE BEST!



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POWERFUL HEATERS, ECONOMICAL IN FUEL, EASILY OPERATED.

Send for Catalogue. *Correspondence Solicited.*

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Sole Manufacturers, *LITTLE FALLS, N. Y.*

WARM AIR FURNACES

FOR

HARD COAL. SOFT COAL. NATURAL GAS.

CASINGS: 28 to 62 Inches.

FIRE POTS: 16 to 32 Inches.

The most complete assortment ever offered a dealer.

KERNAN

Well Mounted.

Perfect Castings.

Honest Values.

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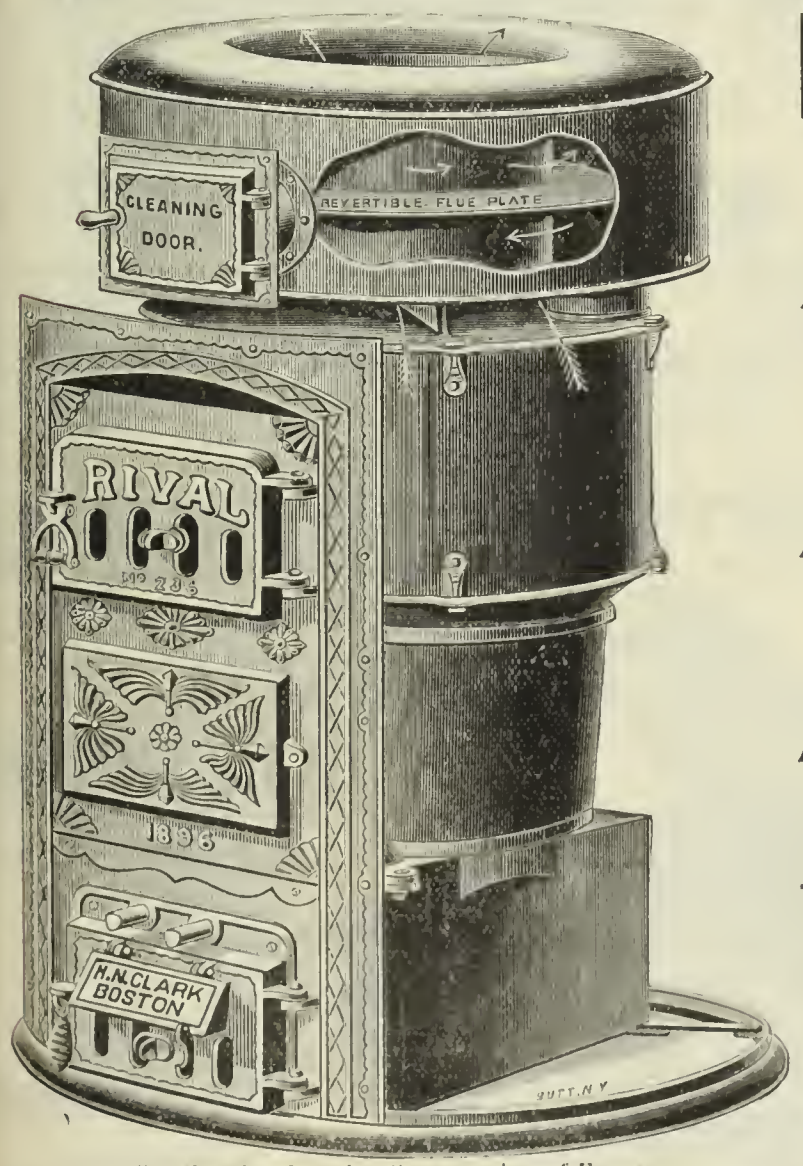
CHICAGO. NEW YORK CITY, 105 Beekman Street. UTICA, N. Y.



Cut showing Interior Construction of Furnace.

RIVAL FURNACE.

SPECIAL FEATURES.

Adapted for all kinds of Anthracite coal.

Has a HEAVY STEEL combustion chamber.

A RETURN FLUE RADIATOR.

An improved TRIANGULAR REVOLVING GRATE, that can be easily removed and replaced.

Excellent CLEANING facilities.

A very POWERFUL and ECONOMICAL heater.

This is a Medium Priced Furnace that can be Retailed at $40 to $65, Paying a Good Profit.

Send for Catalogue and Wholesale Price-List.

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GRAFF & COMPANY
MANUFACTURERS
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NEW YORK

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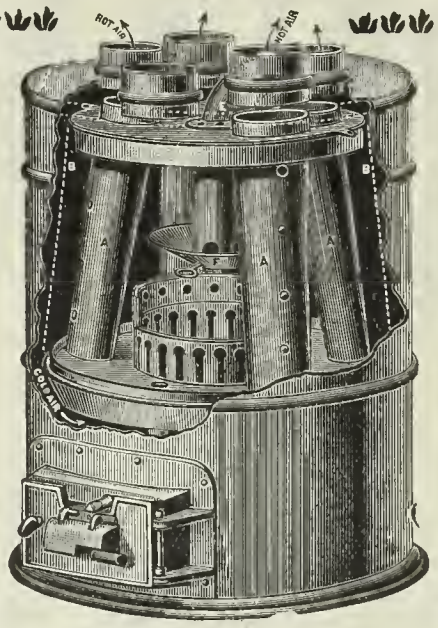
HOT BLAST,
OREGON,
RIVAL AND DREXEL
GREATEST VARIETY.
MOST GOOD POINTS
FOR ALL KINDS OF FUEL.

STANDARDS OF EXCELLENCE,
BEST OF WORKMANSHIP,
MOST ECONOMICAL IN FUEL.
BEST IN HEATING QUALITIES.
FAULTLESS RANGES
THE VERY BEST.
GET OUR CIRCULARS & PRICES

Do You Want to Increase Your Furnace Sales ?



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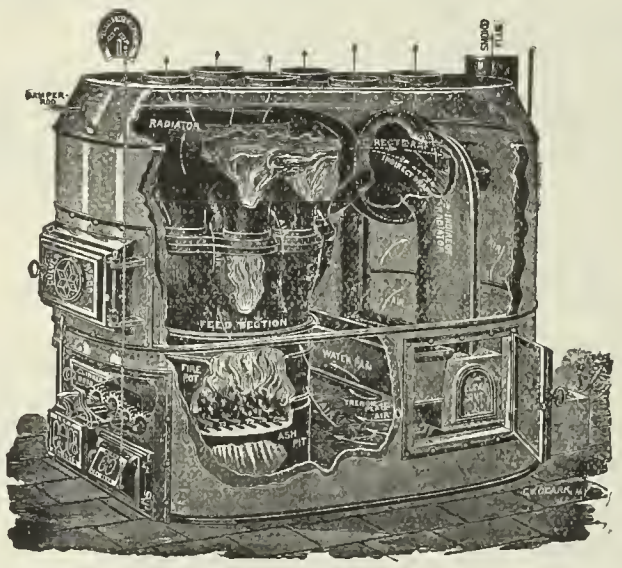
POSITIVE FURNACE
WILL DO IT.

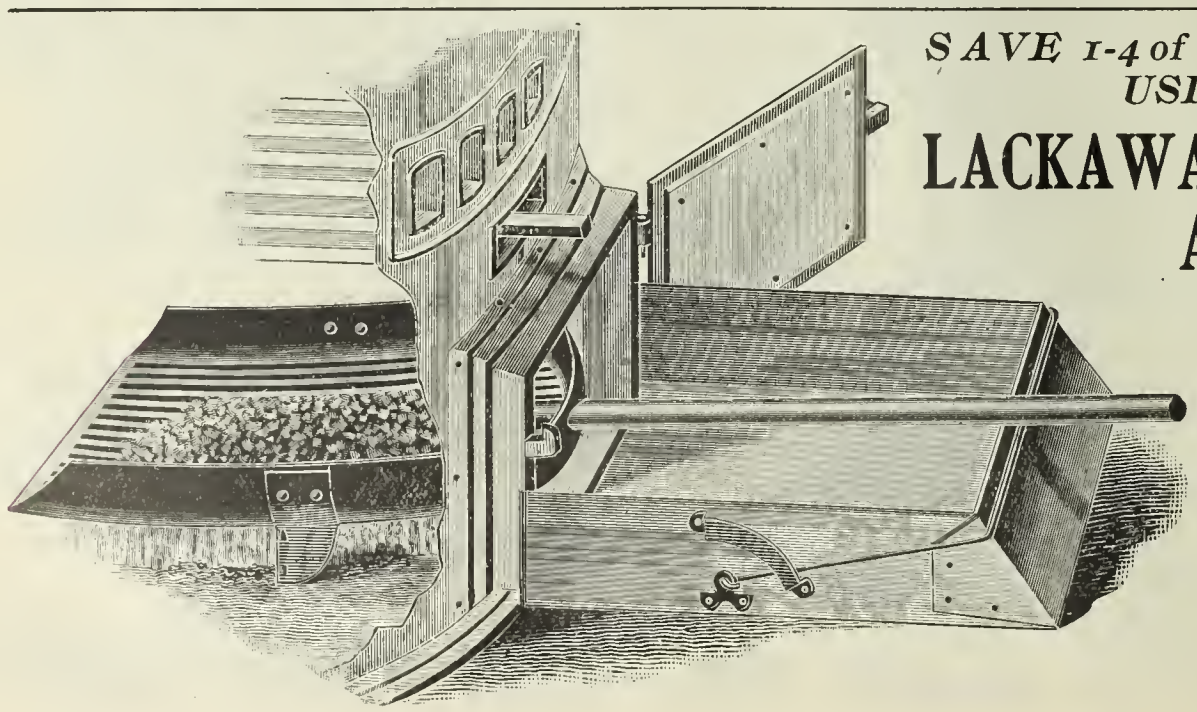
The public are not asleep, and when any decided improvement is placed at their disposal they soon show their approval, as our past sales of the Positive show, and our encouraging orders for 1897 from firms who set the Positive in 1896, being the first year it was put on the market.

SEND FOR CIRCULAR AND PRICES.
THEY WILL INTEREST YOU.

THE TURNER HEATER CO.,
BRISTOL, CONN.



THE SIMONDS FURNACE CO.,
SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,
No. 50 CLIFF ST., NEW YORK,
Manufacturers of the Celebrated
"CULVER AND MONTANA FURNACES."
Double and Single Oven Ranges, with special features and latest designs.
STEAM AND HOT WATER BOILERS.
Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.
Send for Catalogues and Prices.



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LACKAWANNA ASH SIFTER,
Manufactured and Sold by
The Cleveland Stamping & Tool Company
CLEVELAND, OHIO.

1897

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Hot Water Heaters,
Steam Boilers and Radiators.
THE STANDARD OF THE WORLD.
SEND FOR LATEST TRADE CATALOGUE.

SOLD ONLY THROUGH THE TRADE.

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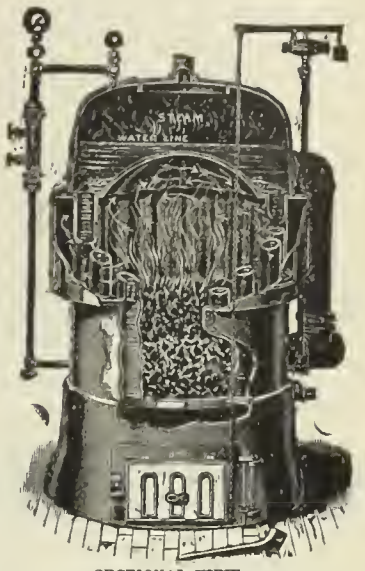
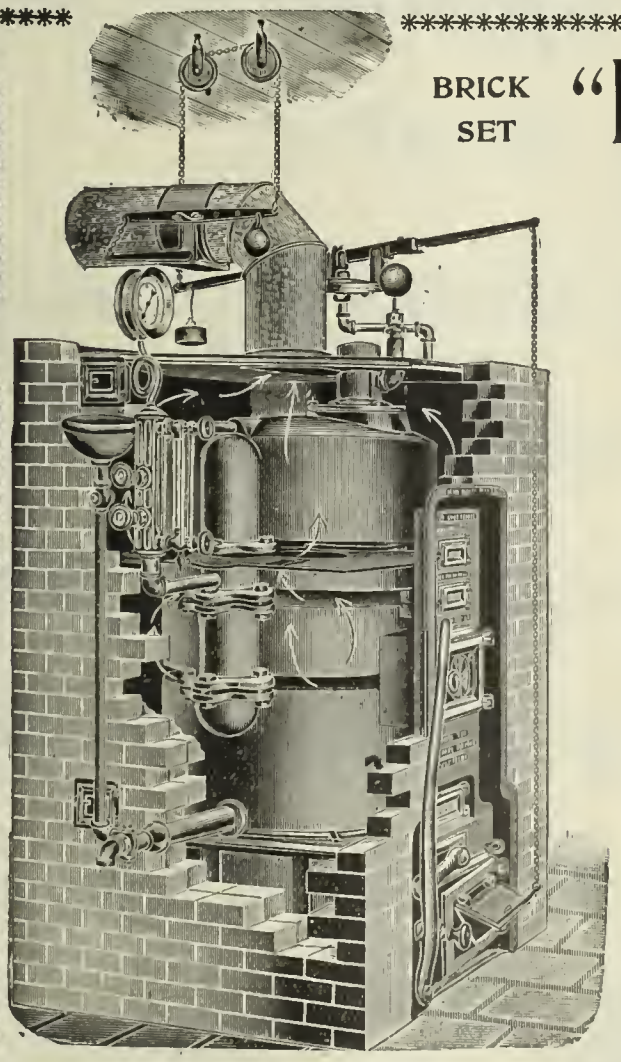
New York City Branch, 48 Centre Street.



SECTIONAL VIEW.
DORIC SEAMLESS TUBULAR STEAM BOILER.



BRICK SET "Plummer" STEAM HEATER "New Model."

Cut shows Boiler and how it is put together, from Ash Box to Steam Dome. Arrows show in which direction fire must travel to reach chimney.

A large amount of available heating surface, which can be easily reached and kept clean, makes it a very *powerful heater.*

Every boiler tested 60 lbs. cold water pressure and warranted free from imperfections. The Plummer has stood the test as an economical and practical *house warmer* for 12 years.

MADE IN OUR OWN FOUNDRY AND MACHINE SHOP.

Send for Prices and Territory.

The Putnam Foundry & Machine Co.,

PUTNAM, CONN.

MANUFACTURERS,
Plummer Steam Heater, Leader Hot Water Heater,
Plummer Sectional Boiler, Nutmeg State Furnace.

THERMOSTATIC PLATE

TO HEATER DAMPER OVER PULLEYS.

QUICK and gradual ACTION

No "FLIP-FLOP" from one *extreme* to another,

IT REGULATES WITHIN A DEGREE.

HOWARD

Automatic Draft Regulator

MANUF'D BY

HOWARD THERMOSTAT CO.,

N. Y. OFFICE— OSWEGO, N. Y. —210 WATER.

The *DAMPER* is operated uniformly with the changes in temperature and not opened and closed suddenly. The movement and power is obtained directly from the *PLATE.* From a normal position to wide open or closed, the change is

BUT ONE DEGREE.

THE P

who use Stoves and Ranges know only, and will not buy goods w called "grades" or "qualities." Y for silver by calling it silver.

"GARLANDS" are always kept ahead intrinsic merit than any other line.

For next grade goods our new line of "M for style, finish and selling qualities, and are

These are

makers of

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DETROI

EOPLE

hat GARLAND STOVES AND RANGES "The World's Best" stands for first quality
ich are made in several so-
u might as well try to sell pewter

all imitations, and possess more features of

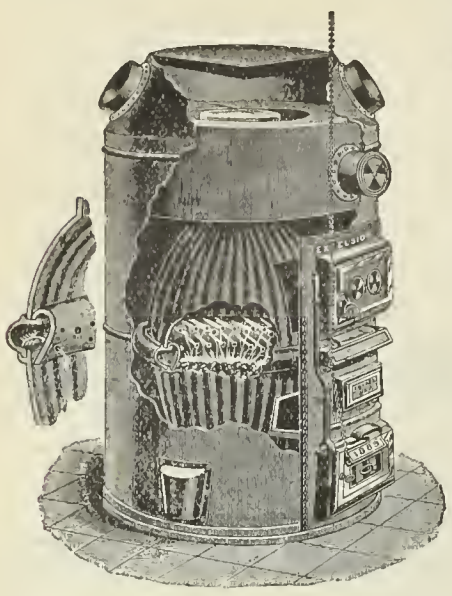
CHIGAN" Stoves and Ranges are unequaled
d at very low prices.

me of the reasons why we are the largest
oves and ranges in the world.

Michigan Stove Company,

Largest Makers of Stoves and Ranges
in the World,

CHICAGO, BUFFALO.



FURNACES
AND
FITTINGS.

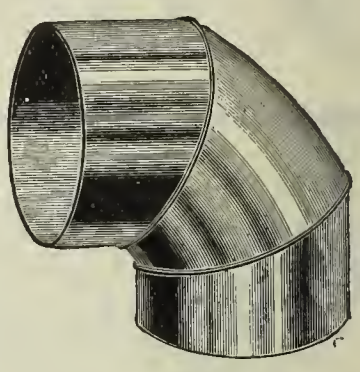
ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

THE EXCELSIOR STEEL FURNACE CO.,

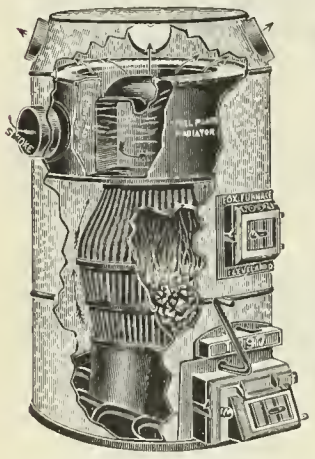
38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.

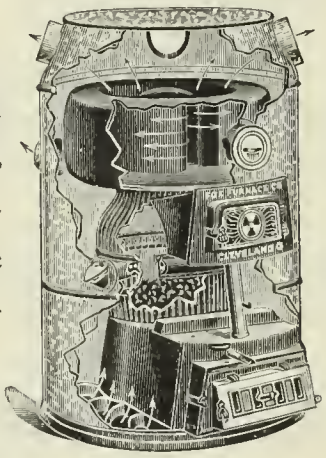


TOP RETURN FLUE.

The Fox Furnace Co.,

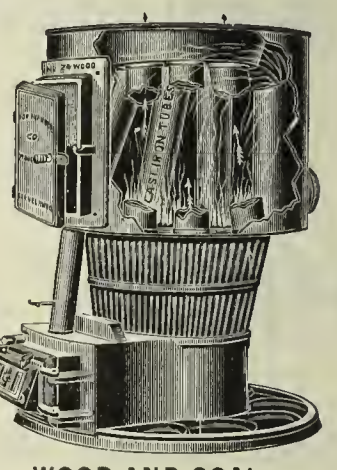
Seneca, Noble and Bright Sts.,

Cleveland, Ohio.



ALL CAST IRON.

Have you a **Fox** Furnace? If not, let us interest you in them. A descriptive catalogue and price list will be sent you on application.



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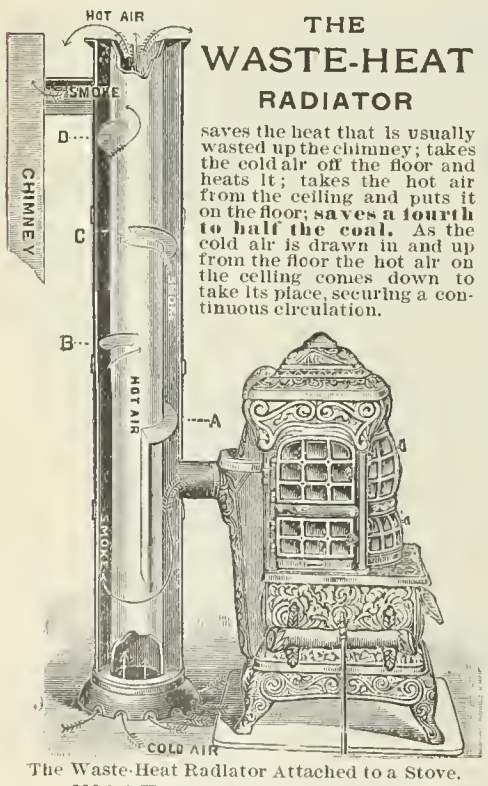
No. 36 La Salle St., CHICAGO, ILL.

The Moncrief-Dowman Co., = = Atlanta, Ga.



The Waste-Heat Radiator Attached to a Stove.

THE WASTE-HEAT RADIATOR

saves the heat that is usually wasted up the chimney; takes the cold air off the floor and heats it; takes the hot air from the ceiling and puts it on the floor; **saves a fourth to half the coal.** As the cold air is drawn in and up from the floor the hot air on the ceiling comes down to take its place, securing a continuous circulation.

TO STOVE AND FURNACE DEALERS:

DEAR SIRS:—The Waste-Heat Radiators have been in use in Minnesota and other parts of the Northwest, where the thermometer often registers thirty to forty degrees below zero, for the past three years and have been thoroughly tested, so they are no experiment; but until within the past few months, they have been made only in a limited way, as each one had to be made to order owing to the difference in the height of the collars on different stoves and furnaces, but now we can make them with sliding collars and that they can be adjusted to fit any stove or furnace, therefore can make them in large quantities and do a general business in them.

The following people have used them during the past two or more years, to any of whom we refer: W. W. Rand, Sec'y Minneapolis Gas Light Co., Minneapolis, Minn.; J. C. Oswald & Co., Minneapolis, Minn.; Wm. Cunningham, St. Paul, Minn.; R. A. Lanpher & Co., St. Paul, Minn.; M. M. Gasser Co., Duluth, Minn.; W. W. Schiffman, Duluth, Minn.

The letter printed herewith from Mr. Clifford Hubbell, Cashier of the Columbia National Bank, Buffalo, N. Y., speaks for itself.

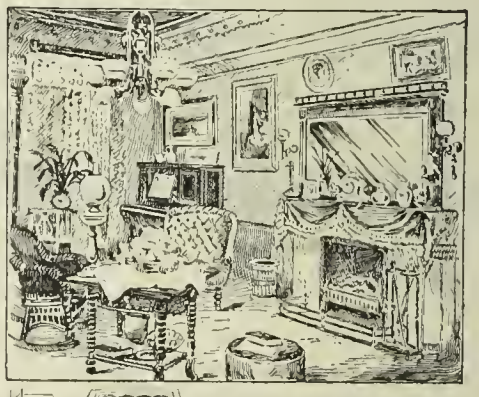
COLUMBIA NATIONAL BANK OF BUFFALO.
JOSIAH JEWETT, President.
CLIFFORD HUBBELL, Cashier.

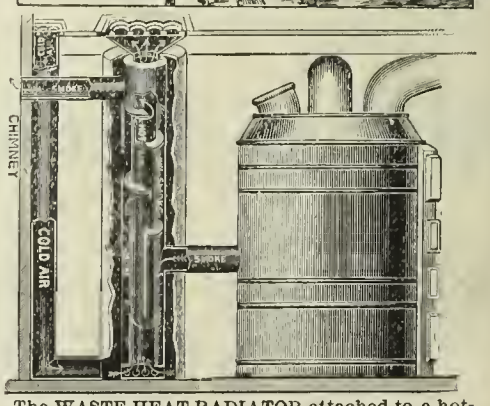
BUFFALO, N. Y.

DEAR SIRS:—Regarding the Waste-Heat Radiator which you placed in my residence, No. 71 Highland Ave., I have to say that it has worked admirably. I believe that the furnace burns 25% less coal now than formerly, and I think that that percentage is a very low estimate. In my mind the greatest advantage is that it draws the cold air from that part of the house where the cold air most accumulates, and makes the temperature in the rooms much more even, conducing thereby to comfort and healthfulness. I know that my wife, being skeptical about patent inventions of any kind, before this was put in, has come to acknowledge that this accomplishes the purposes for which it was purchased; viz., to save a large portion of the waste heat that goes up the chimney, and to save in the amount of coal burned, and make the temperature more even.

Yours respectfully,
CLIFFORD HUBBELL, Cashier.

In order to introduce our Radiators we will send one to any reliable Stove or Furnace Dealer and if he finds it as we represent it then we want him to buy it and take the exclusive sale of them in his city; otherwise to hold it subject to our order. Yours truly,





The WASTE-HEAT RADIATOR attached to a hot-air furnace; attaches to steam and hot-water boilers in the same way.

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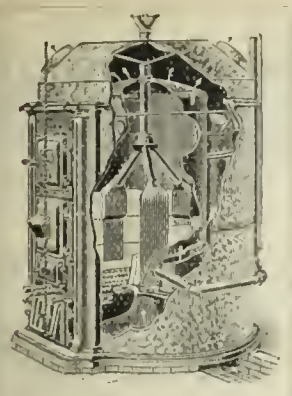
T. H. GREEN & CO., DULUTH, MINN. (Western Depot.)



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"Grand Range."

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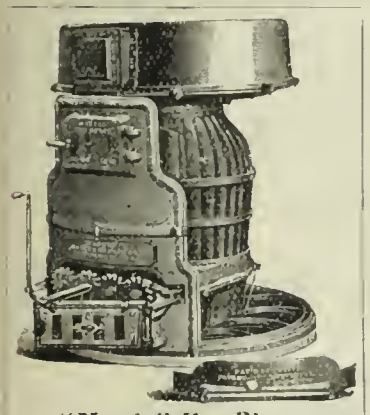

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and visit their salesrooms,

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Come everybody to this informal gathering and get acquainted with us and our methods of doing business.

"Mystic" Water Heater.

REMEMBER the name "MAGEE," and that we have a full and complete line of Ranges, Furnaces, Combination, Hot Water and Steam Heaters, fully warranted. CORRESPONDENCE SOLICITED.

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Is what there is

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When one of these

ECLIPSE Stoves

Is in use.

WE WILL

Make it hot for you if you will

JUST GIVE US A CHANCE.

Write for Catalogues and Discounts.

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STREVELL HDW. CO. Agents for State of UTAH.

See adv. of the Triumph Eclipse Steel Range on page 18.

Carbon Eclipse Air-Tight Heater.

Perfect Eclipse Oak.

We Are Thankful

For the patronage and many favors of our customers and friends, and wish to express the hope that they will enjoy their "Thanksgiving Turkey," or if this reaches them after the feast, that they did enjoy it and will live to enjoy many more.

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Supreme Excellence

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LEADS
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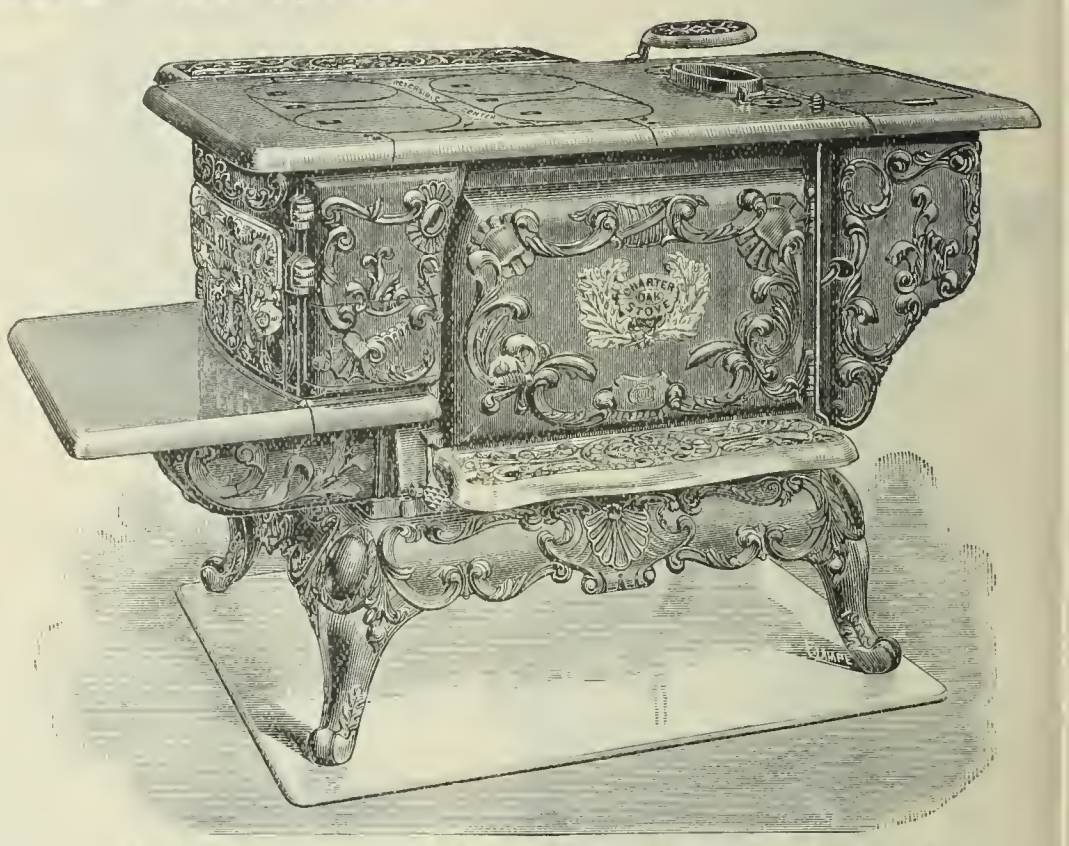

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We Provide for the Happiness of the Children, too.

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Made in every detail just like full-sized stoves, and with the same care. They will bake roast and cook to perfection.

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This **Stove** has been run more than **One Year** on **Hard Coal, Soft Coal** and **Coke,** and has never made a clinker, or **Anything** like one.

Order your **Sample Now,** and test the **Stove,** and be ready for next season.

Write us for Booklet containing record of tests of various **Coals** and **Coke** to determine their relative values as fuels, and also description of the **SPECIAL RETORT OAK,** the **Stove** in which these tests were made.

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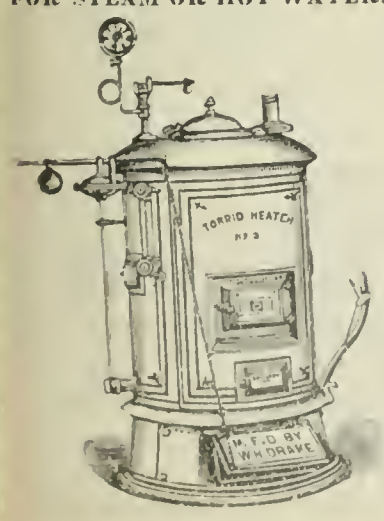
FOR STEAM OR HOT WATER.



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IT HAS NO PACKED JOINTS.
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Plans of various systems are given and a full account of all the details of a successful heating job.

CONTENTS.

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" 2. General Questions on Heating.
" 3. Low Pressure Steam.
" 4. Two-Pipe Steam Heating.
" 5. Single Pipe Low Pressure Steam Heating.
" 6. Indirect Steam Heating.
" 7. Hot Water Heating.
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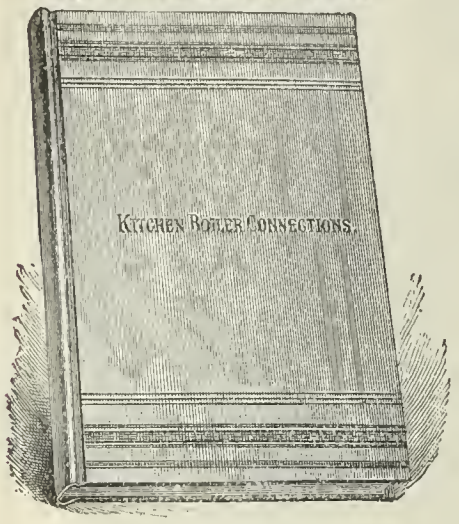

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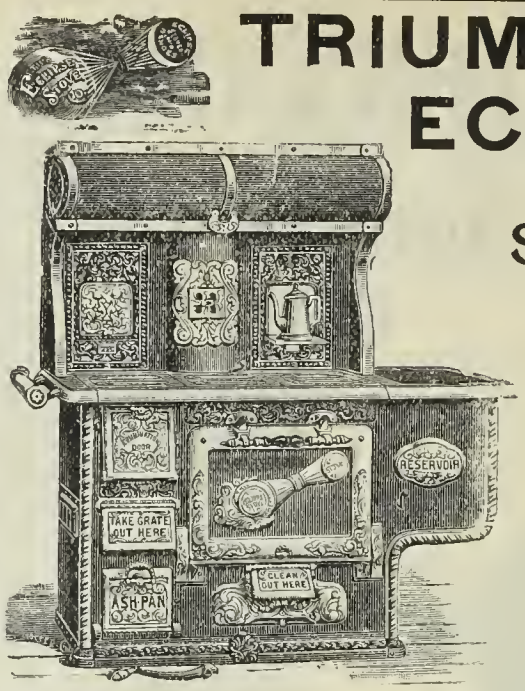

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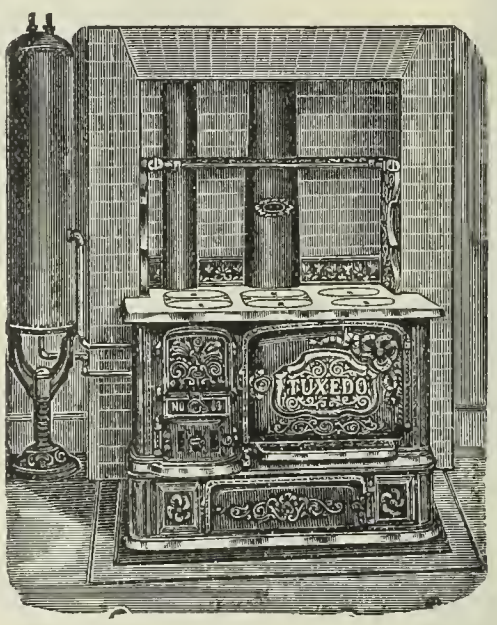

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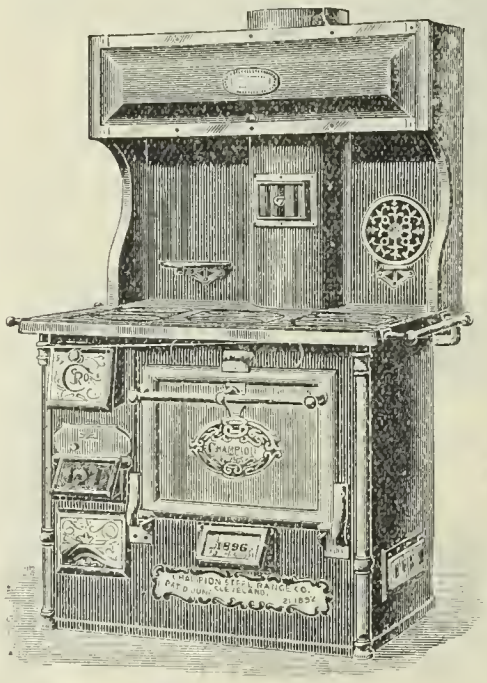

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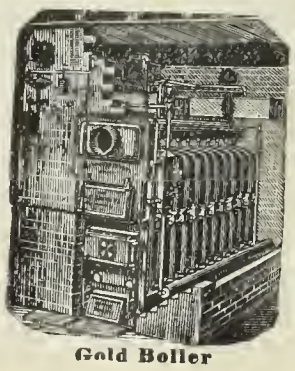

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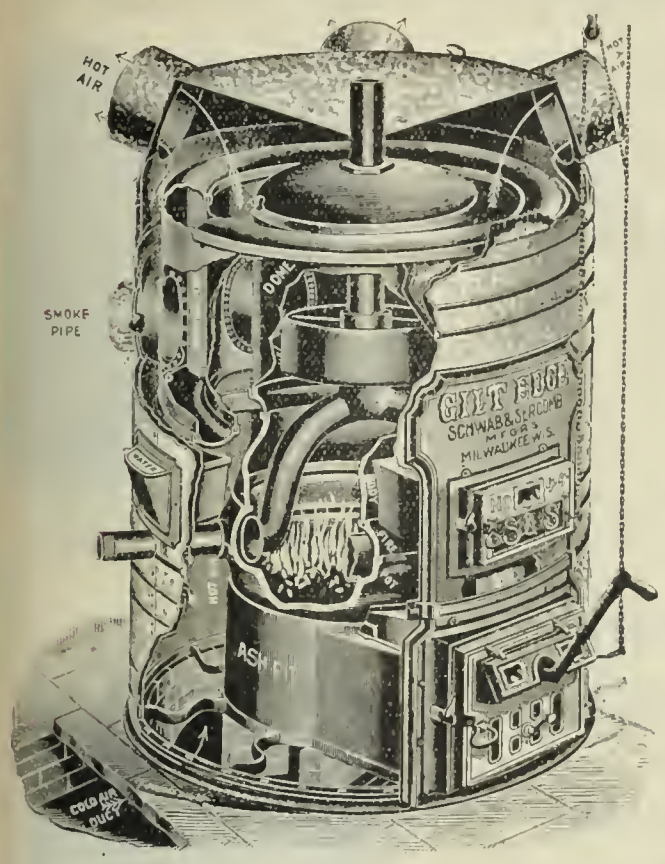

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Manager Heating Department.

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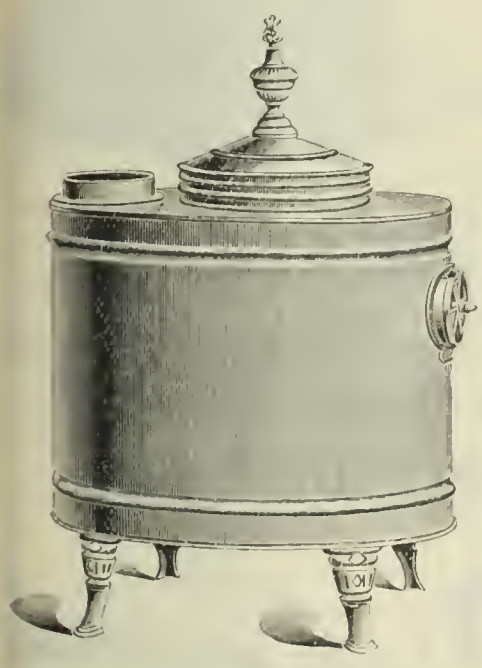

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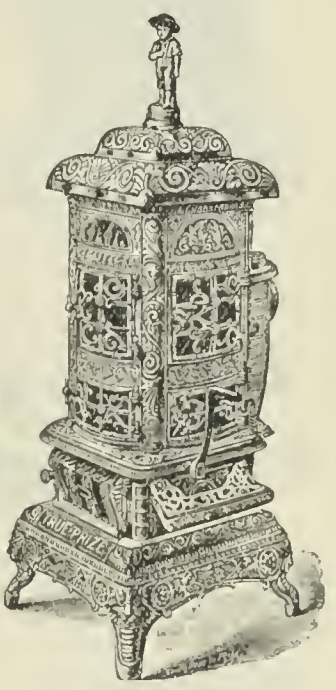

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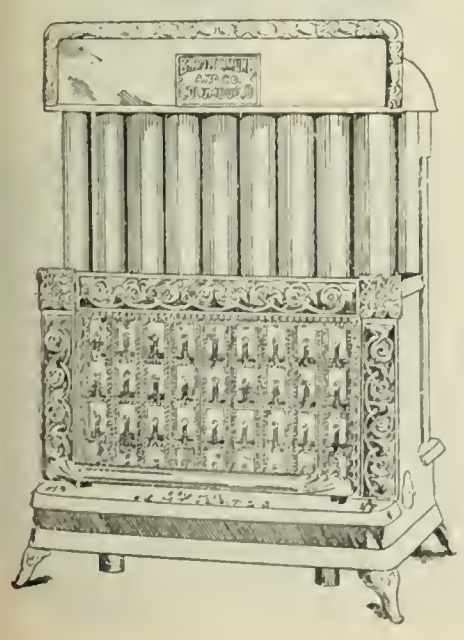

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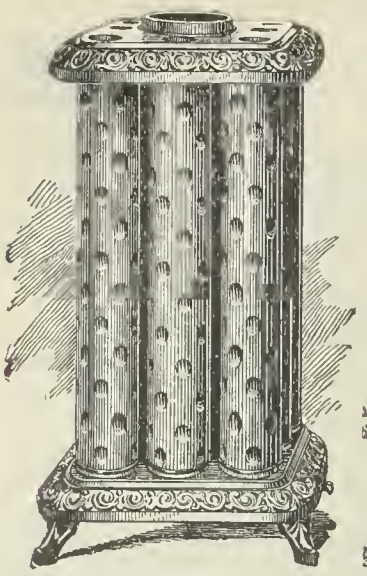

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You can do so. There is no question about it at all. An article that will make one fire do the service of two fires finds many buyers as soon as people know about it.

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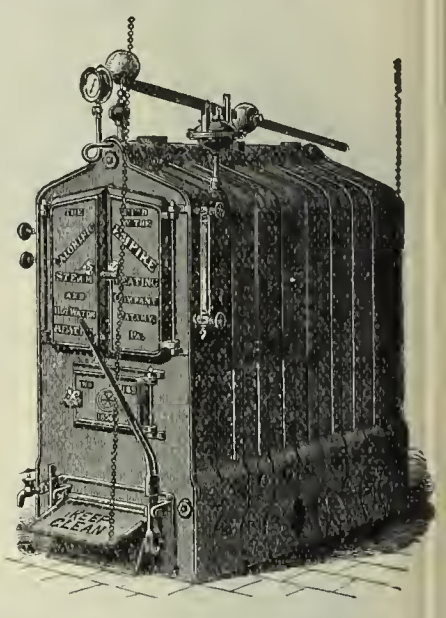

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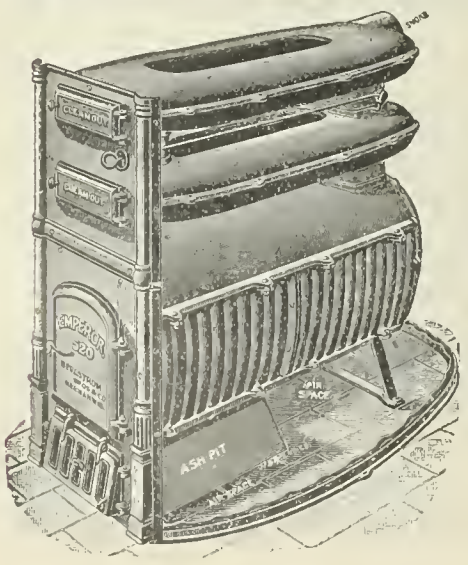

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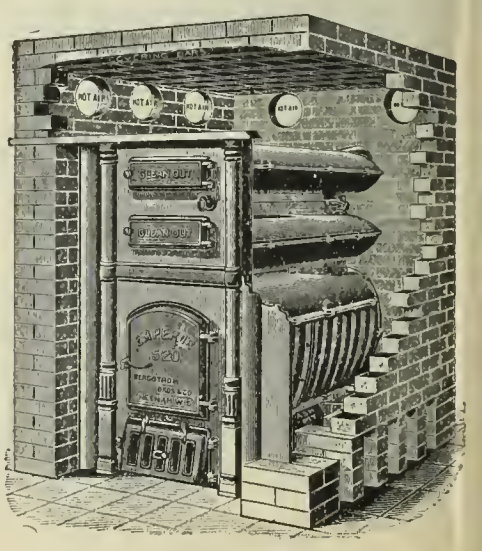

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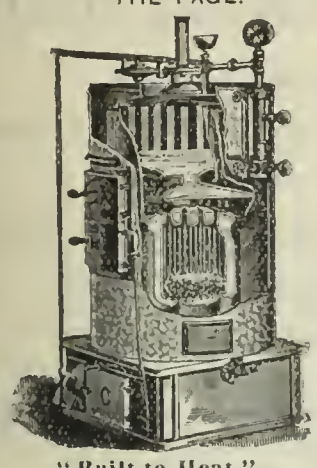

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Even the "new woman" admits he is "a good thing to have in the house."

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The new and up-to-date Steam Fitter must admit that the

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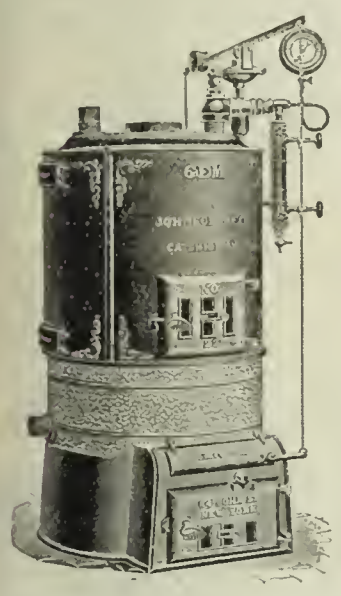

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Steam in this Heater is generated very rapidly at a minimum cost. Waste of fuel is not possible in this construction, as at every point in the course of the draft the heat is absorbed by the water.

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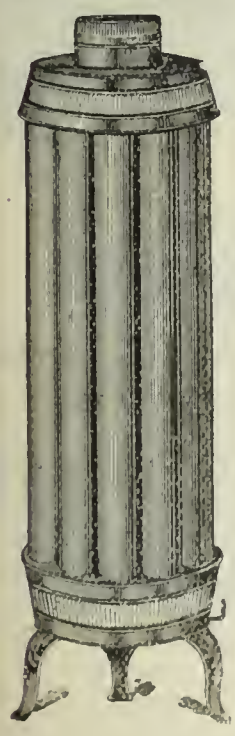

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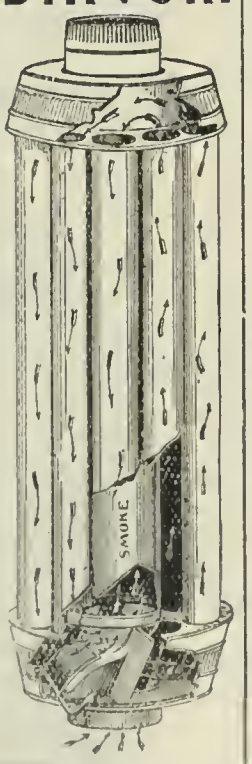

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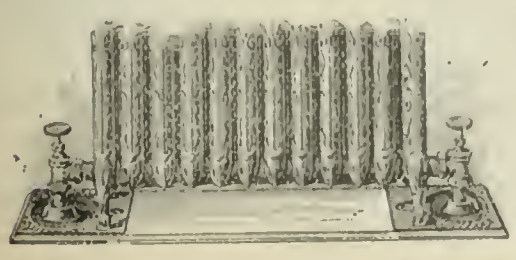

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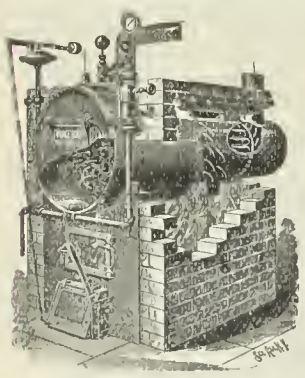

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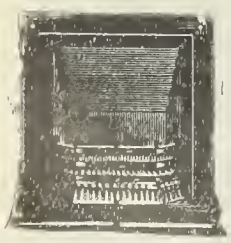

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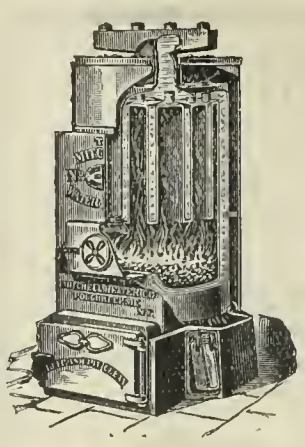

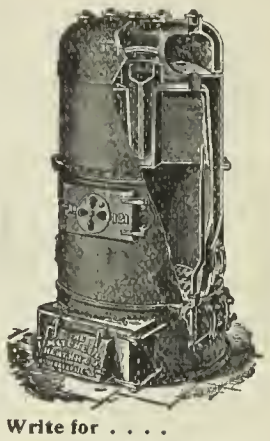

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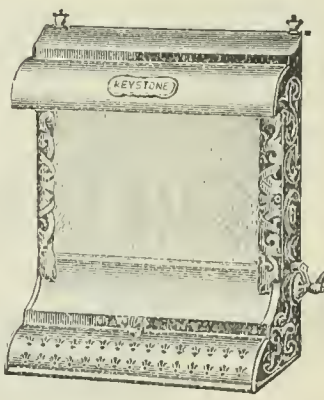

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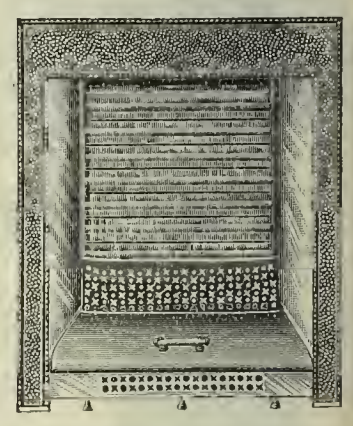
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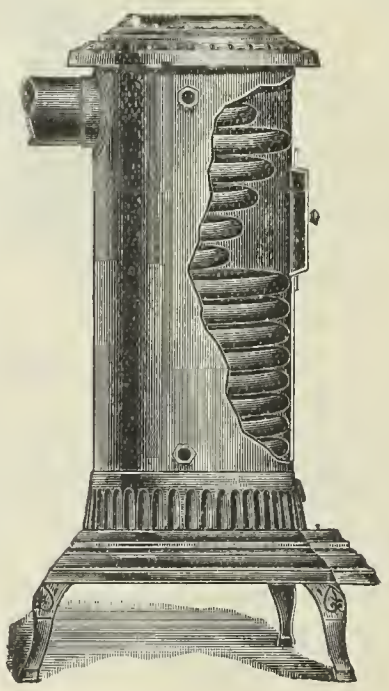

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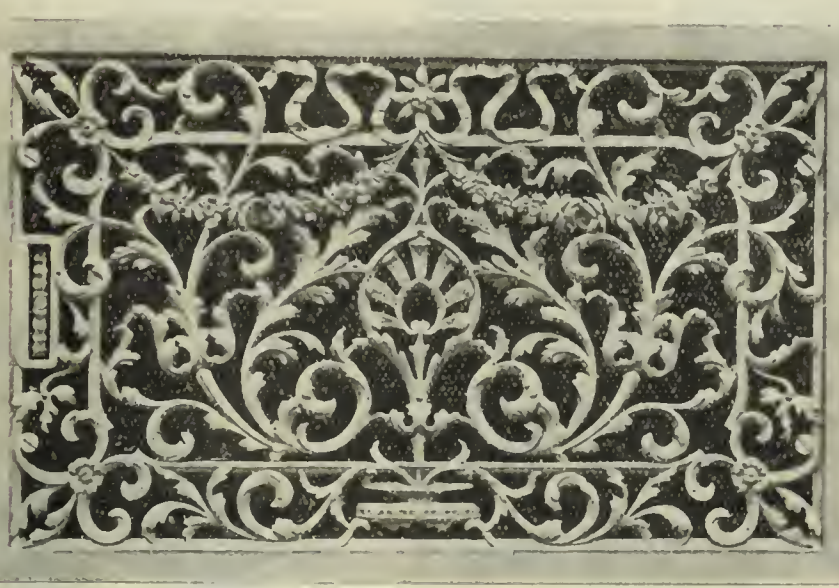

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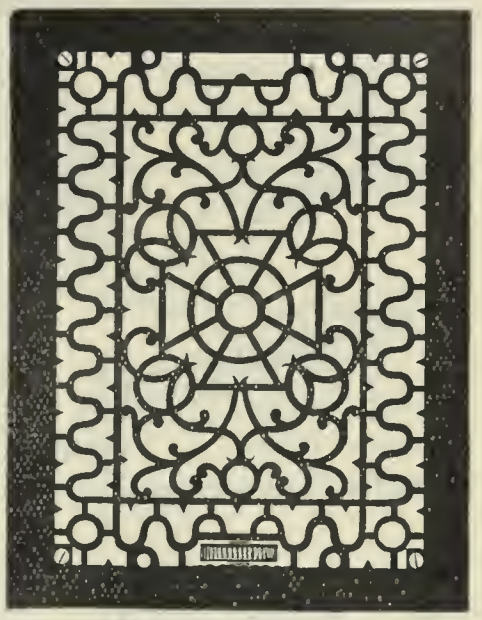

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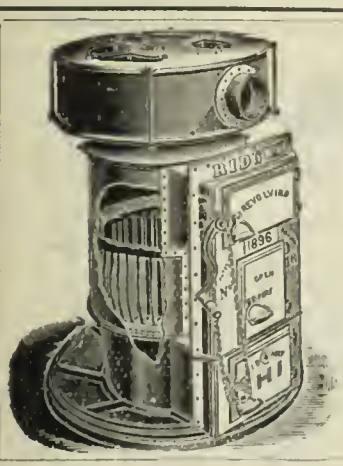

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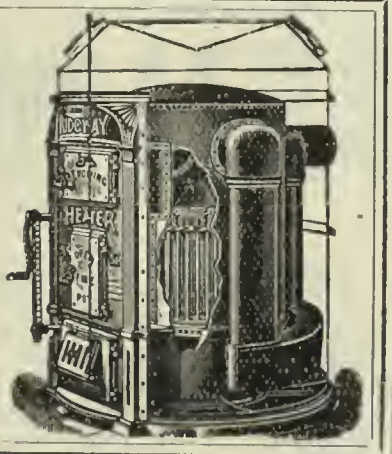

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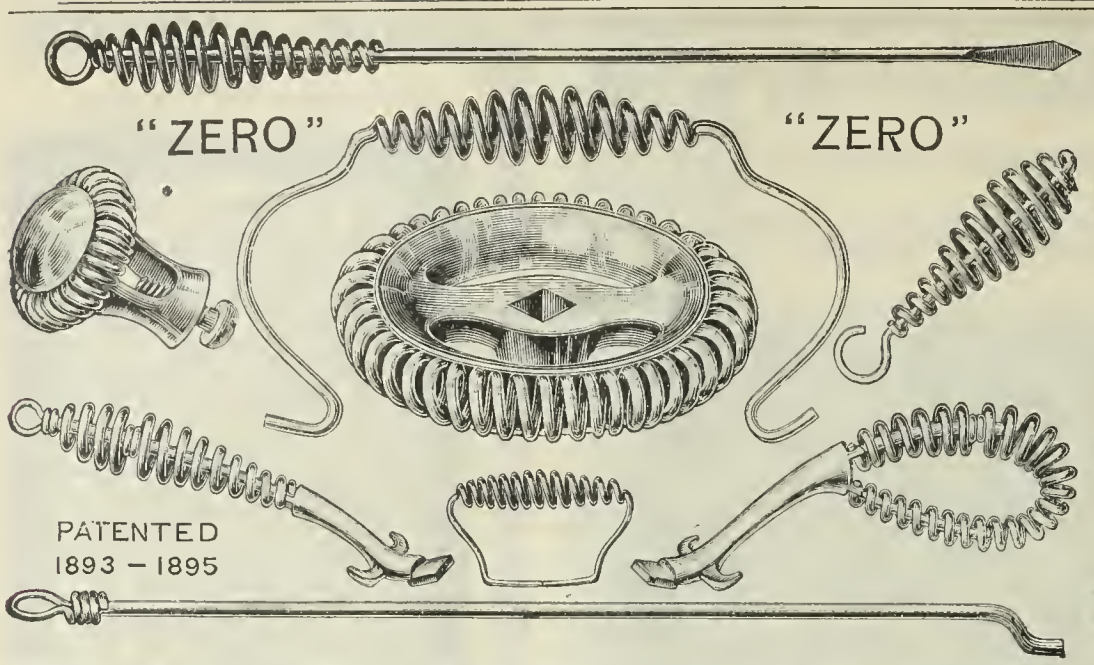

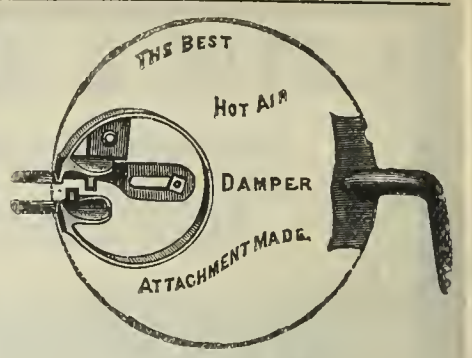

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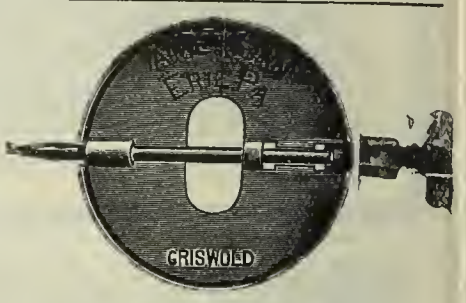

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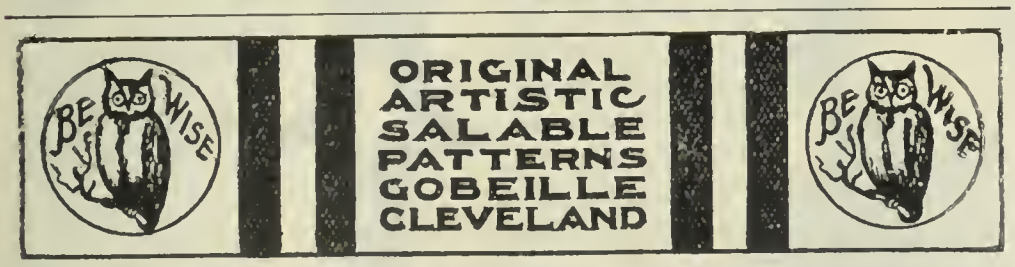

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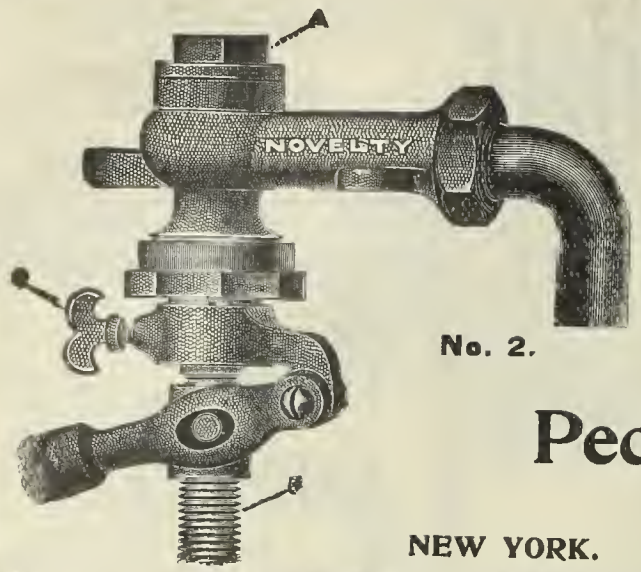

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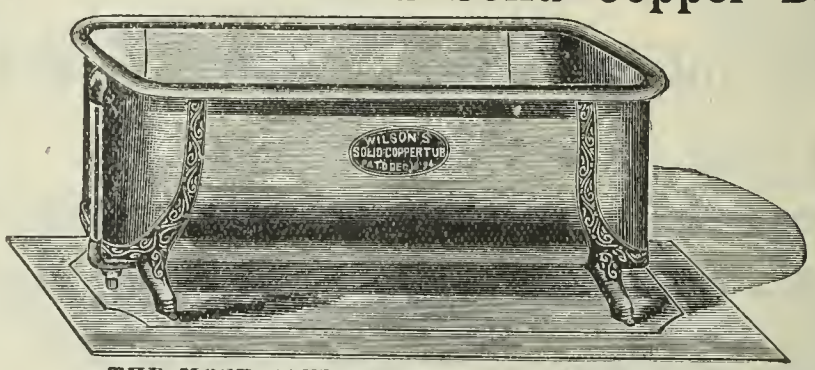

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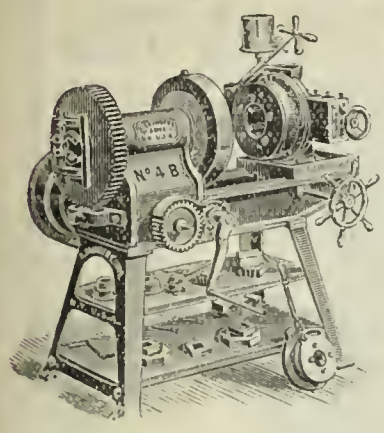

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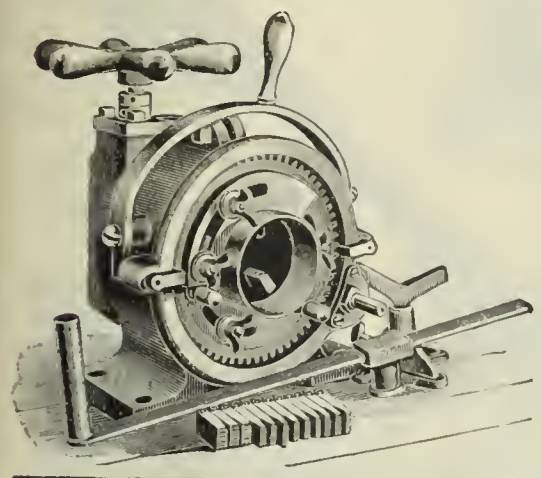

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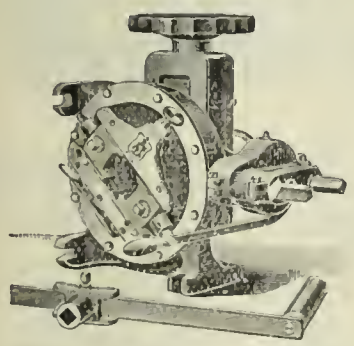

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That "THE BOSTON" is the CHEAPEST PRACTICAL Cleanout on the market.

ABSOLUTELY WATER TIGHT

As it is made with Ground Joint, requiring no screws or washers.

READILY ADJUSTED.

Made with Heavy Iron Body, neatly Japanned, and Brass Cover. A Durable and Perfect Casting.

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The KENNEY System of WATER CLOSETS

Are used in the largest and finest office buildings in New York. Among them are

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Send us your address, and in return we will send you a catalogue of the best line of specialties in the United States.

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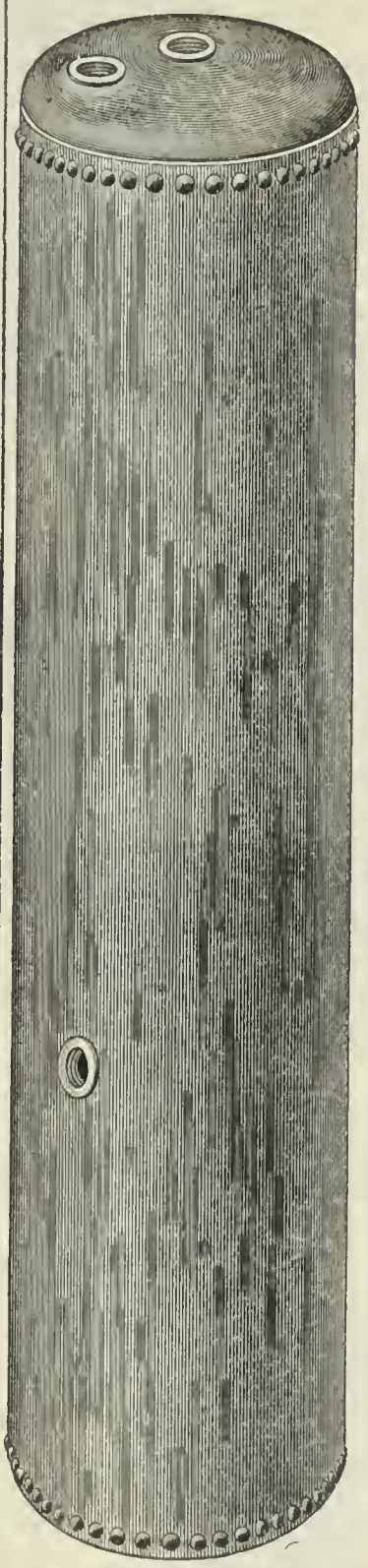

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When Buying Boilers, ask for the "WOLFF" Boiler.

GALVANIZED RANGE BOILERS.

We operate a complete and extensive plant for the manufacture of Range Boilers, Expansion Tanks, etc. We do our own *Galvanizing*, make our own *Rivets*, and do the drawing-up work of the heads; our customers can therefore rely upon getting a first-class high grade Boiler. It is the best made. We make these Boilers in all sizes, from 18 to 192 gallons capacity; also Boilers with Galvanized Iron Steam Coils inside (horizontal and vertical), Boiler Hangers, Stands and Brackets.

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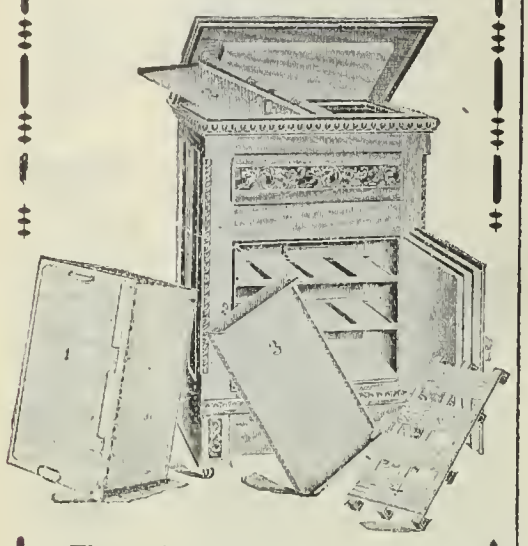
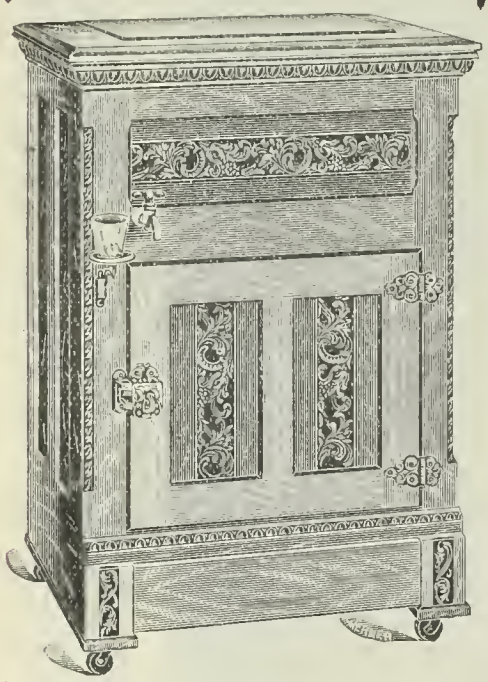


The only Removable Tank Refrigerator having a positive circulation of pure cold dry air by means of removable flues.



The "Eclipse" has a larger ice capacity than other refrigerators.

THIS SAVES ICE.

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THE VERY LATEST.
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KEEP YOUR HANDS CLEAN.

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Is a great improvement over the old stove brush for blacking stoves, **without getting a speck of blacking on hands.** The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth.

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ARCADE DAMPER, POKERS AND LIFTERS.

From latest improved patterns and designs.

Don't fail to get our Prices and Samples.

Our goods are up to date in all points

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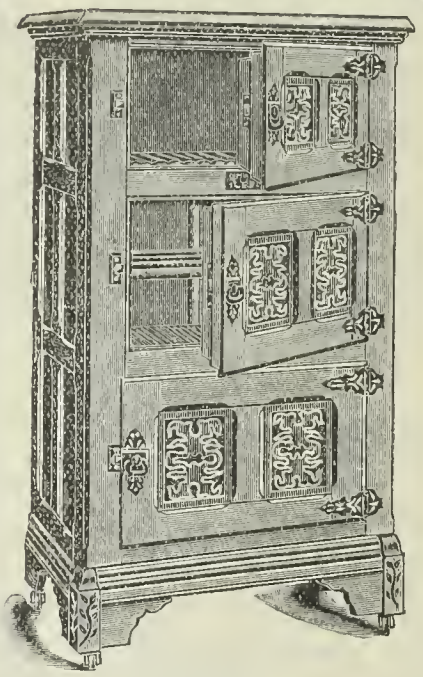

Large dealers in first-class refrigerators will do well to ask for our 1898 catalogue and discounts.

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Challenge Corn Planter Co.,

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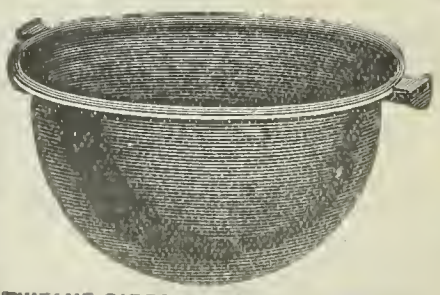

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Full measure, guaranteed **perfect**, original patterns, with metal **distributed** where it is needed. **Many** Caldrons are made from our castings as patterns. They are inferior to original, as they have light bottoms and heavy sides and hold less.

D. R. SPERRY & CO.,

HOLLOW-WARE FOUNDERS,

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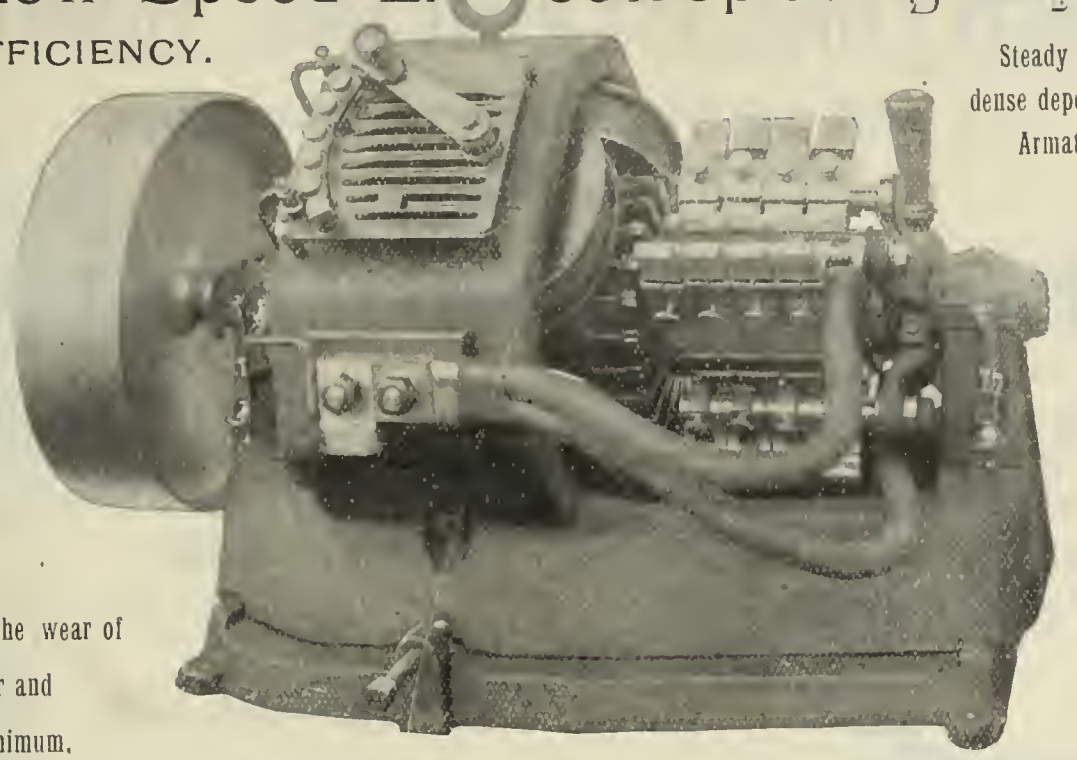
Eddy Low Speed Electroplating Dynamos.

HIGH EFFICIENCY.

Large Commutator and Brush Capacity, insuring cool operation at full load.

No sparking with variable load, thus reducing the wear of the commutator and brushes to a minimum.



Steady current, producing a dense deposit of even color.

Armatures bar wound, rendering mechanical and electrical injury practically impossible.

Rheostat on machine for regulation of voltage.

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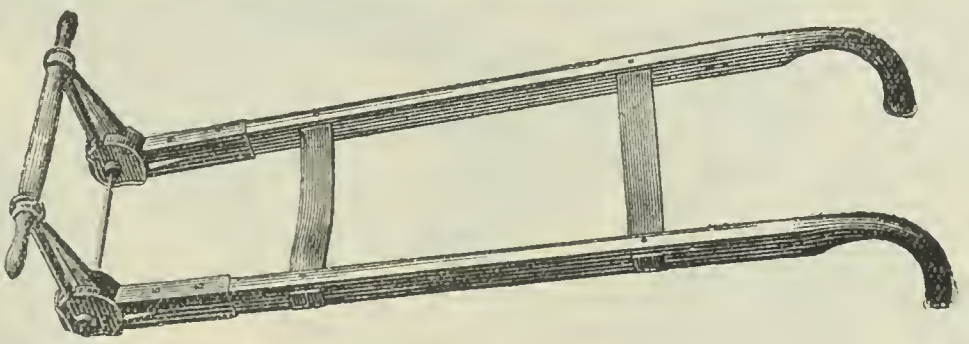

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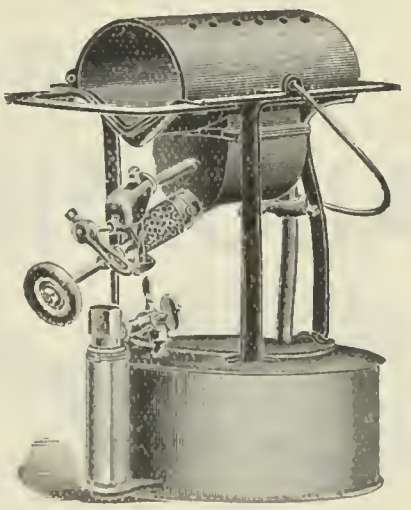

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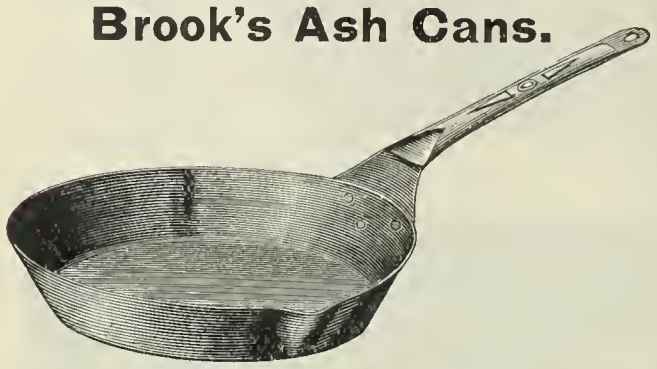

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Proposals Invited.

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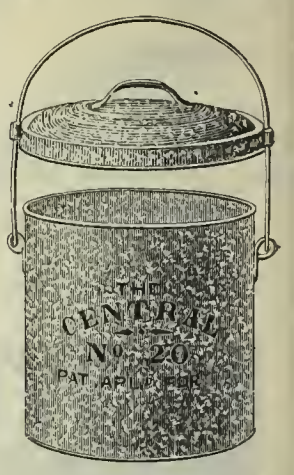

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Cover Always Attached.

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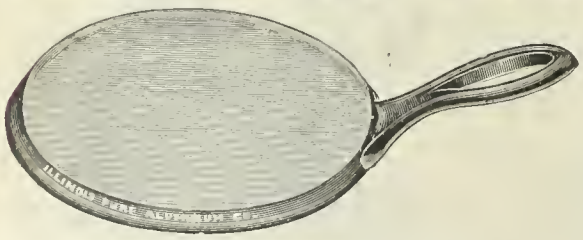

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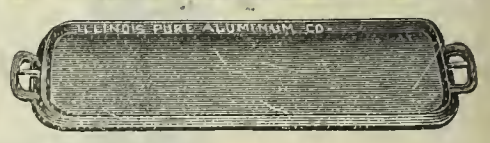

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THESE GRIDDLES WILL COOK CAKES WITHOUT GREASE.

INCLUDE A SAMPLE IN YOUR NEXT ORDER.

The oblong are made in two sizes; the round being made in four sizes. Prices within the reach of all.

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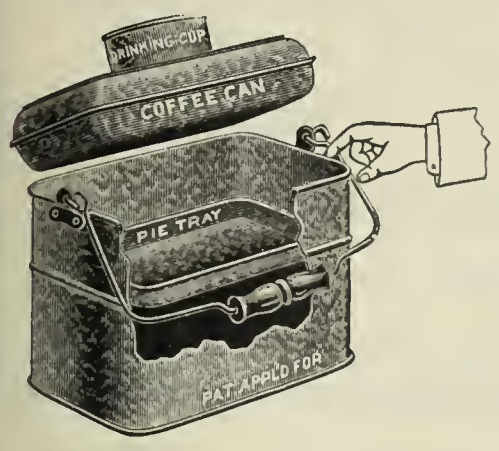

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Notice the Patent Spring Bail Cover Fastener.

A BIG SELLER. ORDER AT ONCE.

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High Grade Enamel Ware.

This Trade Mark on bottom of each article. ☞

DOUBLE COATED and ABSOLUTELY PURE

Contains no ARSENIC, ANTIMONY, LEAD or other poisonous ingredients.

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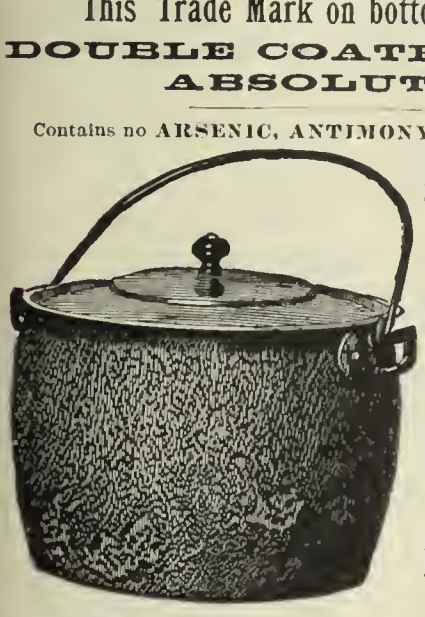

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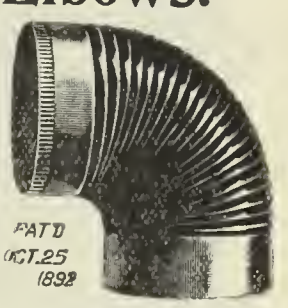

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For CORN and COBS, FEED & TABLE MEAL. Improved for '97-'98. Send for all mills advertised. Keep the best—return all others.

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Granite Ironware AND Dripping Pans.

Fine Black and Galvanized Sheet Iron.

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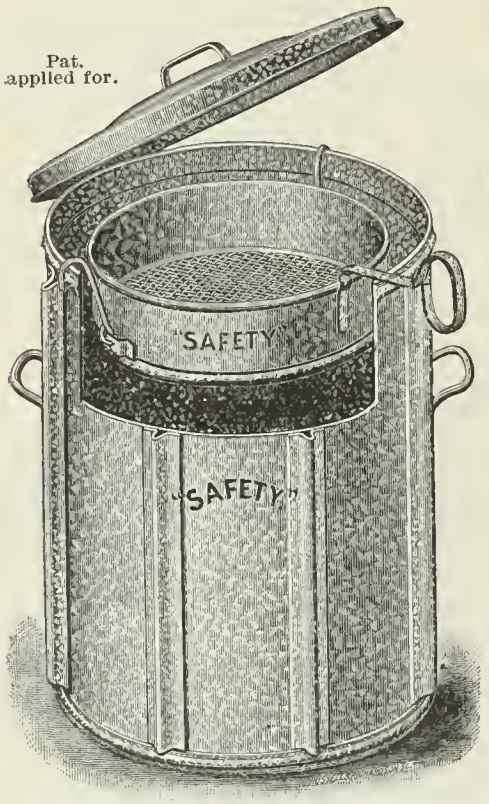
NEW All Iron, Galvanized

SAFETY

COAL SIEVE AND COVER.



No wooden hoop or cover to break; will not rust, and is just the thing for HOT ASHES; and used on our **SAFETY ASH BARREL** is DUST PROOF.

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BOSTON, MASS.

Also makers of a full line of Galvanized Sheet Iron Wares, Factory Fire Buckets, Oily Waste Cans, Garbage Pails, Chamber Pails, Coal Hods, Oil Cans, Ash Barrels, etc.

SEND FOR CIRCULAR.

—"Now, boys," said the teacher, after delivering a little lecture on the divisions of the year, "how many months have twenty-eight days?"

"All of them," promptly replied a bright boy in front.

—SAD AFFAIR.—Prison Visitor—Why are you here, my poor man?

The Poor Man—Fer takin' a loaf o' bread and a ham bone, mum.

"How sad!"

"You bet your life it was said. W'y, lady, right alongside o' that bread an' meat was a dozen bottles o' beer, and I didn't know nothin' about it!"—*Indianapolis Journal.*

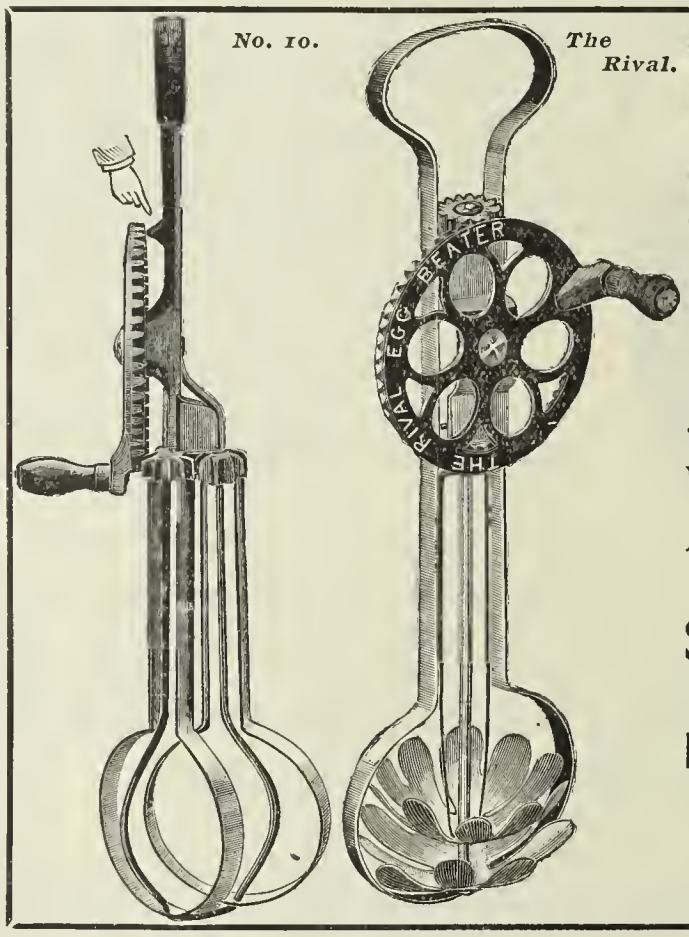
THE "H. & W."

The Only Perfect Self-Basting Baking and Roasting Pans.

The Latest improved and Most Perfect Pan in Use. Made of Planished Steel.

The Self-Basting "H. & W." also combines *all* the advantages of other pans; its simplicity of construction enables the user to adjust and handle it readily; very durable and easily cleaned. The *only* Pan with *Indentations in the Top, making Self-Basting Positive.* See cut.

THE HILL-WHITNEY ALUMINUM CO., - - Boston, Mass.



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A Treatise on Pattern Cutting as Applied to all Branches of Sheet Metal Work.

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Parts of the former treatise, entitled The Metal Worker Pattern Book, have been utilized in the preparation of this

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but these have been REWRITTEN AND SIMPLIFIED, and later methods embodied which have come into use since the publication of the original work.

218 Problems are now given,
75 of which are entirely new

The greatest care has been taken with the explanatory portions of the work, enabling the student, without any previous training in mathematics and drawing, to become a FINISHED PATTERN CUTTER.

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Triangulation is here for the first time treated systematically and in a way to meet the practical needs of the trade.

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This work in its perfected form is a complete

Encyclopedia of Pattern Problems

for Tinners, Cornice Makers and Sheet Metal Workers, all of whom should be provided with a copy.

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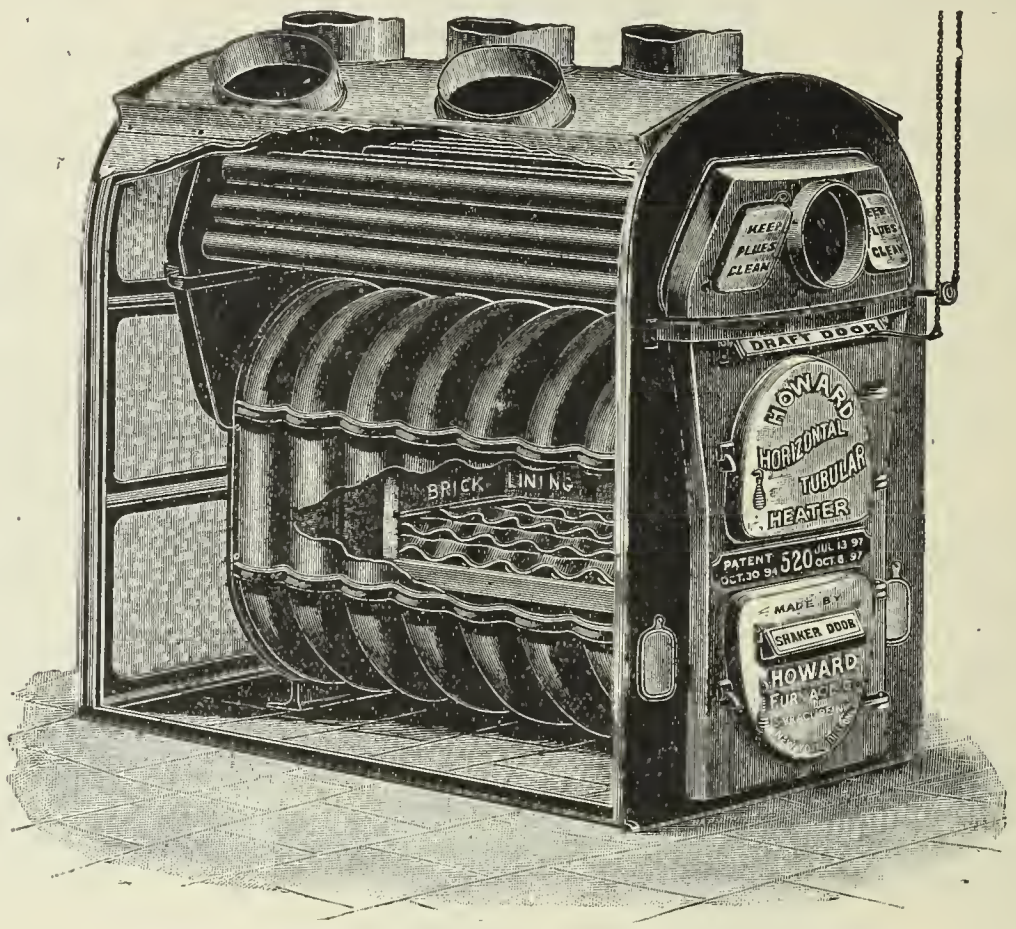
a succinct statement

Some manufacturers of furnaces have an idea that they can fool the dealers by talking about a large flue radiator. The proper way to utilize the fire travel is to retard the draft. The impinging properties of the heat are in this way gained. If the fire travel be split up into a number of small flues, immediately after leaving the combustion chamber, a retention of heat is obtained, and five (5) times more heating surface is exposed for generating warm air.



Patented: Oct. 30, 1894. July 13, 1897. Oct. 5, 1897.

does this astonish you?

The truth of this statement is aptly illustrated in the cut, which shows a tubular constructed radiator. It is a self evident fact that if the above radiator were made in one large flue, the heat in its travel to the chimney would be quickened, a less contact surface given and a cooling influence avoided.

THE MAKERS,

Howard Furnace Co.,

Syracuse, N. Y.

NEW YORK OFFICE,
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THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, November 27, 1897.

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Volume XLVIII.....No. 22.
Index to Reading Matter.....Page 57.

The Business Situation.

The approach of the close of the year and the holiday and stock taking season is reflected in a general slackening of trade in wholesale lines. Merchants and the larger consumers are generally confining their orders for goods to such limits as will fill their current needs and carry them over into the new year with the smallest volume of stocks in hand necessary to meet their requirements. The retail trade, however, has been feeling the stimulating effect of colder weather in an increased call for winter goods in all parts of the country. Southern trade is reviving and reports from that section, as well as from the West, indicate an unusually large movement of retail business for the season of the year. Bank clearings last week, while rather below the exceptionally heavy total of the previous week, were still large and considerably in excess of last year's figures, showing more activity than in the corresponding season of any previous year except 1892, when speculation was abnormally active. At the present time stock exchange speculation is remarkably flat, so that the figures were swelled by actual commercial transactions. Wheat has again shown an upward tendency, cash wheat in New York passing the dollar mark during the week. The exports of the cereal so far in November have been about 50 per cent. greater than last year. In the past week they were among the heaviest on record. Atlantic exports amounted to more than double last year's shipments, owing to the heavy European call for American breadstuffs—a call which, from all appearances, will continue indefinitely, or until all our spare stocks are exhausted. There is no change worthy of note in connection with the leading industries. The iron and steel trade is quiet, as regards new business, with prices a shade lower in a few directions, and no special improvement looked for in the next two or three months. The metal trades are dull to the verge of stagnation, and the trades catering to the building industry are almost equally lethargic. All speak hopefully of the outlook for next year, however, and are making preparations for a good business in the spring. The plethora of idle money in the New York banks serves to keep the local money market extremely easy. The banks are now seeking employment for their surplus funds in the London market, where they are offered at rates which are lower than those prevailing in that center. Should this movement assume large proportions the effect would be a stiffening of loaning rates here. The demand for commercial paper is brisk and far outstrips the offerings of good material. Collections are generally reported as satisfactory.

Local papers of the Indiana gas belt are commenting very strongly upon the deplorable waste of natural gas that is going on in parts of that region. An alarming decrease in gas pressure exists at various places, especially in Madison County, where a number of important industries are dependent upon the gas for fuel. The waste is attributed to the operations of the oil men, the gas finding an unchecked outlet from a number of the oil wells, and little or no attention being paid to the Anti-Waste Gas law of the State. At Alexandria a particularly unfortunate condition of things prevails in this respect. In that town and vicinity about thirty oil wells exist which, according to the Anderson *Herald*, are throwing out into the air millions of cubic feet of gas daily. It is calculated that these wells are wasting in this way about $9000 worth of gas a day, or $270,000 a month, and as this waste has been going on for several months the total amount of loss is shown to be enormous. There appears to be no way of adjusting the matter. An effort was made to enforce the penalty of $20 a day for the waste, but the attempt does not appear to have been successful and the waste goes on.

Formation versus Reformation.

BY FOSSIL.

It has been written that the poet is born, not made; and the credence which we give this assertion depends upon our definition of the term poet, whether it be liberal enough to cover all claims to the title, or restrictive to a higher standard. In like manner we may say that the mechanic is born, not made, provided we insist upon a strict construction of the word. If the broad and general meaning be taken, we must conclude that there are mechanics, and mechanics, alike in kind, but differing widely in degree; a difference which leads to classification and terms of comparison. Selecting for consideration from the mass of artisans, those who are prospectively eminent, it may be shown that, other things being equal, those who are endowed or born with certain desirable faculties will surpass their competitors who must acquire them by introduction. There is a prophecy in the boy of what the man may become under favorable circumstances; and when the community at large recognizes its right and duty to change the policy of curing evils by pruning to that of prevention by cultivation and training there will be fewer social and mechanical misfits.

Paternity is invested by both natural and civil law with authority, which, while demanding obedience, is under obligation to promote the interests of the subject both present and future, and this duty lacks of fulfillment if confined to the physical wants of infancy. We have, in common with other animals, a care for the young of our kind, running parallel thereto and often subject to the same natural limitation. The power to produce does not give the wisdom to guide, and we do not expect the builder of a ship to be for that reason a navigator; but many men are both fools and fathers.

If it be admitted, as observation teaches, that humanity gives early indication of what its unbiased course would be, or, as may be said—limiting the scope of the subject—the mechanic is born, not made, it follows that if society desires the best results it should concern itself to find out and foster incipient ability. We have established a code of sanitary laws which limit the old time liberty of the individual, making it secondary and subservient to the general good, and this has been done in the face of much opposition. Some of us will remember former battles in the warfare of private versus public advantage, and may recognize a quotation from an old poem which now reads like a fulfilled prophecy :

> " Why, sirs, if we submit in quiet,
> They next will regulate our diet;
> And say by law, we sha'nt eat carri'n,
> Or flesh of beasts that died of murri'n."

Having established the right to punish mechanical ignorance, we may possibly expect that to be an entering wedge toward the right to prevent it, by selection and cultivation of the fittest. Men do not "gather grapes of thorns or figs of thistles," neither do they expect to do so, since a knowledge of the infant plant settles the question of its product if left in normal condition. When we learn that formation is better than reformation there may be a necessity shown for additional public care and direction.

Good Times in Indiana.

A press dispatch from Anderson, Ind., states that compiled reports from every section of the gas belt indicate that over 90 per cent. of the manufacturing concerns are in full operation and 50 per cent. of them are operating night and day. Of the 10 per cent. still idle fully four-fifths are window glass plants, which are closed not because there is a scarcity in demand, but because labor is not satisfied to accept a wage scale which is a 15 per'cent. advance over that of last year, and is holding out for an increase equivalent to almost 30 per cent. advance. The most notable exception to the statement that nearly all plants are operating is the malleable iron works at Marion, which are closed because of various complications.

A year ago only about 60 per cent. of the plants were running, and that 60 per cent. included the window glass houses. Two years ago the percentage was still lower, and three and four years ago the number running was represented by 33 per cent.

More men are at work in Indiana gas belt plants today than at any time before, and their wages aggregate a larger sum than at any time in the past. With possibly three exceptions there has been no reduction in wages. There are many companies who have voluntarily increased wages from 2 to 15 per cent.

European and American Costs of Producing Pig Iron.

An English journal has undertaken to make the following comparison of costs of making pig iron in Europe and in the United States :

Very few people appear to be aware of the great changes that have recently occurred in the costs involved in the manufacture of pig iron in different countries. It has hitherto been assumed, and to a large extent with reasonable accuracy, that Great Britain had facilities for the manufacture of cheap iron that existed nowhere else. Up to a year or two ago that was probably true. So far as Europe is concerned it still remains the case—at any rate, among countries that manufacture pig iron on a large scale. But the conditions that make for the economical production of iron are changing from year to year, and almost from month to month, and it is to be feared that many of these changes do not tend to improve the relative advantages and supremacy of our own country. Our three chief competitors in Europe are Germany, France and Belgium. We still produce pig iron more cheaply than any of them. But we do not produce iron so cheaply as is done, or should be done under ordinarily favorable conditions, in the north of Spain, and we are a long way behind the facts and possibilities of the United States. The north of Spain has the great advantage of cheap ores almost on the spot ; but it has to import most of its fuel from Great Britain. Recently, the development of a coal field in the Asturias has provided the Bilbao region with another source of coal supply, so that it appears to be probable that the cost of fuel will be lowered by and by. As it is, the statistics presented in the following tabular statement show that at Bilbao the cost of a ton of coke is about 21 shillings, against 13 shillings 3 pence at works in Cleveland and 14 shillings at works in Germany (Westphalia), while the Spanish cost of ore, assuming that the works possess their own mines in the locality—as some of them certainly do—is only about 12 shillings per ton of pig, against a present cost of 30 shillings for the same class of ore bought at current prices in Great Britain, and 32 shillings in Germany and Belgium. The cost of fuel in the United States is cheaper than in any European country, and in some cases at least within our knowledge does not exceed 6 shillings per ton of pig. On the other hand, Pittsburgh makers do not enjoy much advantage over our own so far as the cost of iron ores is concerned, owing to the greater distances over which the ores have to be transported. Speaking generally, the cost of producing a ton of Bessemer or hematite iron to-day will only amount to about 37 shillings 6 pence at Pittsburgh, against 49 shillings 6 pence in Great Britain (in the Cleveland district—on the West Coast the cost will be several shillings more), 52 shillings 3 pence in Westphalia, 53 shillings in Belgium and 57 shillings 9 pence in France. In making these estimates we have taken the cost of labor at the furnaces at average rates in reasonably good practice. The details are appended :

Statement Showing the Estimated Average Cost of Producing a Ton of Bessemer Pig Iron in Different Countries, assuming Current Market Rates and Freights.

	Great Britain. Cleveland.	Germany. Westphalia.	Belgium. Liege.	France. Loire.	Spain. Bilbao.	United States. Pittsburgh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Iron ores..	1 10 0	1 12 0	1 12 0	1 18 0	0 12 0	1 7 6
Coke.....	0 13 3	0 14 0	0 14 6	0 13 6	1 1 0	0 6 0
Limestone.	0 2 0	0 1 6	0 1 6	0 1 6	0 1 6	0 1 6
Labor.....	0 2 9	0 3 0	0 3 6	0 3 3	0 3 9	0 2 6
Sundries...	0 1 6	0 1 9	0 1 6	0 1 6	0 1 6	0 1 0
	2 9 6	2 12 3	2 13 0	2 17 9	1 19 9	1 17 6

These figures do not allow for depreciation and renewals —which are heavy in the iron industry—for petty charges, or for interest on investment ; and when these are added it will be pretty evident that, at the present prices of raw materials, pig makers who have to purchase their supplies in the open market are hardly likely to make a good thing of it. On the other hand, it will be understood that most makers obtain their supplies under more or less special circumstances, such as contracts of old standing or the ownership and working of their own mines. It remains to be seen how far Spain and the United States may in the future push their natural advantages. Both countries have recently been exporting increasing quantities of pig iron, and it would not surprise us if much more were done in this direction.

Hints on Ventilation and Heating.

Mrs. Alice P. Norton recently gave a talk at the Women's Educational and Industrial Union School of Housekeeping, at Boston, Mass. Her subject was "Ventilation and Heating," and many housekeepers and others interested in this plan to study the vexed question of domestic service were present. In considering that which has come to be counted among the lost arts, the ventilation of the modern house, Mrs. Norton said that few patent arrangements are better than a piece of board so placed that the window sash will not shut down. This admits air into the room, but the most sensitive person cannot feel it. Few persons, said the lecturer, comprehend the simple fact that a window dropped just a trifle from the top on each side of a room or hall will change the air, whereas if several are opened wide the sudden cold makes their closing necessary before any air has a chance to enter. Open fire places are inadequate and inexpensive as heaters, but they are good ventilators, especially if they are constructed with that aim. Steam and hot water heating have disadvantages unless the heat is carried into rooms indirectly, whereas a furnace, properly constructed and intelligently managed, should not cause any unhealthfulness.

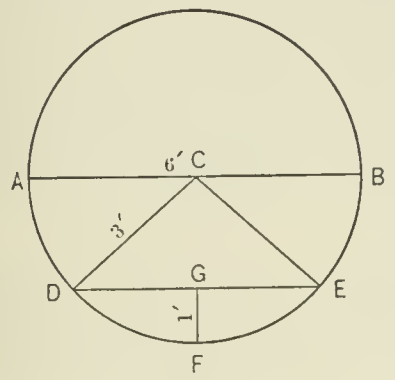
"The great trouble is," said Mrs. Norton, "that we do not supply enough pure air to the furnace, but depend on actual heat from the fire. Put a thermometer down the register and see if you are not surprised at the way it runs up. The cold air box should be well constructed, and as far from the ground as possible, so that no cellar air nor combustible products are carried to the upper parts of the dwelling. A good supply of heat in the halls produces better results than if the rooms only are heated, as the entire temperature then becomes equalized. Rooms well ventilated will heat more quickly than stuffy ones. Members of the family who complain of cold apartments are always the ones who dislike to admit fresh air. Most rooms are kept too hot. The glass should never be allowed to go above 70 degrees, and lower than that is desirable for the average person. As age comes on the body requires more warmth, while children thrive in a low temperature. It is not an uncommon thing for church furnaces to take air from the audience room that has been breathed and heated again, as the plan of providing outside air is considered as too expensive."

THE LETTER BOX.

An Area Problem.

From G. E. S., East Stroudsburg, Pa.—Your rule for finding the area of a segment, in *The Metal Worker* of November 6, is interesting and I have a question of a similar sort I would like to ask. Suppose we have a boiler 6 feet in diameter and there is 12 inches of water in it, what will be the area of the part covered per foot in length with water? We will be glad to have you give a rule for solving this problem.

Answer.—In the accompanying diagram we show a section of a boiler the diameter of which, A B, is 6 feet,



An Area Problem.

and which is filled to a depth of 1 foot, as represented by the line D G E. To find the length of the arc D F E it is first necessary to find the length of the chord D E.

A rule for that is: The chord

$$D\,E = 2\sqrt{D\,C^2 - (D\,C - G\,F)^2} = 2\sqrt{3^2 - 2^2} =$$

$$2\sqrt{5} = 2 \times 2.236 = 4.472.$$

Knowing the length of the chord D E to be 4.472 feet it remains to find the length of the arc D F E. To do this we make use of a table of circular arcs, from which we find the constant opposite the number obtained by dividing the hight G F by the length of the chord D E. Dividing the numbers gives 0.223 and the constant opposite that number in the table is 1.12774. The length of the arc is now found by multiplying this number by the length of the chord, 4.472, which gives as a product 5.04+. Knowing the length of the arc D F E, the surface covered by the water for 1 foot length will be equal to the product of the two, or 5.04 square feet, which is the answer sought by our correspondent.

Loss From Underground Steam Pipe.

From G. W. G., New York.—I wish to run a steam engine with steam taken from a boiler 80 feet away. The steam pipe would be in the ground in a box 12 inches square, the pipe being wrapped with asbestos paper and hair felt and the box filled with sawdust. How much loss will there be in the steam as compared with steam taken from a boiler in the same room as the engine?

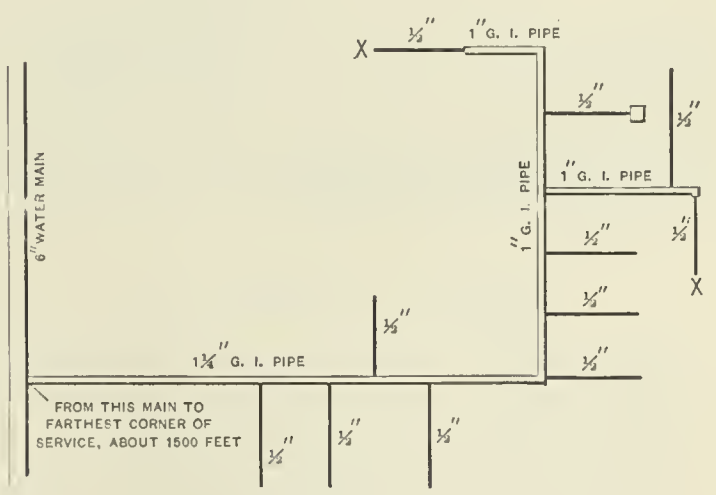
Answer.—With the felting and boxing as described, and with the lack of any details as to size of pipe and power of engine, we can only approximate an answer in the number of heat units lost per hour in several sizes of pipe. We cannot give percentage without knowing size of pipe, pressure of steam and power to be transmitted. We estimate the hourly loss for 2-inch pipe to be 20 heat units per foot of pipe, or 1600 heat units per hour for the 80 feet of pipe; for a 3-inch pipe, 24 heat units, or 1920 heat units per hour, for 80 feet of pipe; for 4-inch pipe, 30 heat units per foot, or 2400 heat units per hour for 80 feet of pipe.

These figures can be turned into coal value by allowing for the boiler output 8000 heat units per pound of coal per hour. This will make the coal loss for the 80 feet of 2-inch pipe equal to 2 pounds of coal per day; for the 3 inch pipe, 2.4 pounds, and 4-inch, 3 pounds.

How to Remedy Water Hammer.

From J. F., Pembroke, Ont.—Inclosed I hand you a sketch of a water main and services taken off the same, with which we are having a great deal of trouble with water hammer. The pipes in almost every house which is supplied by this main hammer to a greater or lesser extent, but in the two services marked X, at the ends of the main, the hammering at times can be distinctly heard 75 yards away. We have carefully examined the plumbing fixtures and cannot find anything wrong with them, and the only theory I can advance is that the 1¼-inch galvanized iron pipe which conveys the water from the cast iron main is too small to supply so many services (11) at such a distance (1500 feet) from the cast iron main. The water pressure varies in this main from 60 to 90 pounds to the square inch at different times during the day. Would you kindly let us know if there is anything in this theory?

Answer.—We do not apprehend that the trouble in regard to water hammer is due to the size of the pipe. The area of the 1¼-inch pipe is more than six times the area



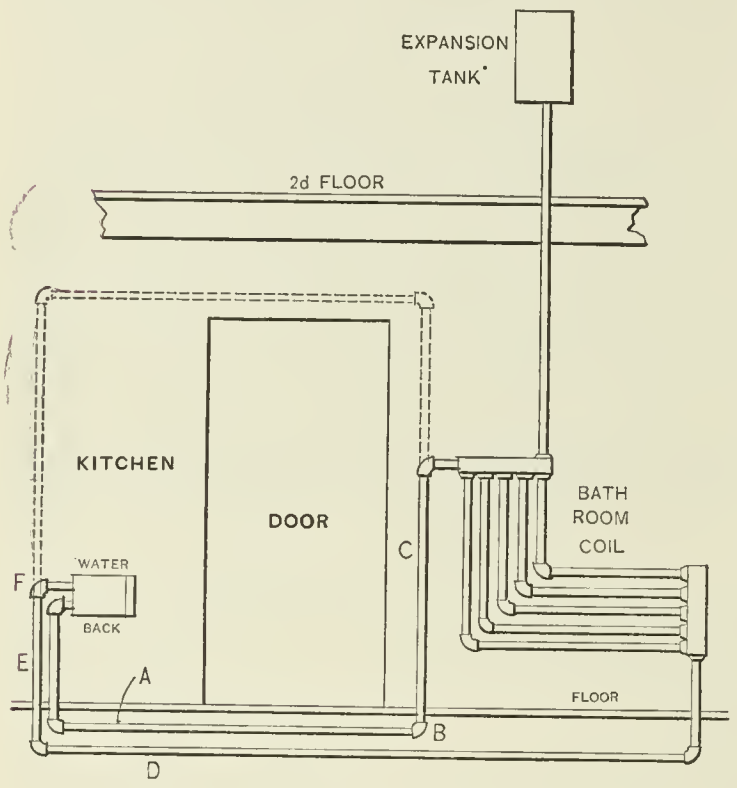
How to Remedy Water Hammer.

of the ½-inch service pipes, and with the high-pressure stated should give a fair supply to all the houses in the ordinary way of using water in dwellings. As our correspondent declares that he can find nothing wrong in the plumbing fixtures there is a strong probability that there is something that is very necessary in high pressure plumbing work that has been left out of the system. The momentum of a column of water in a pipe 1500 feet long is very great, and its sudden arrest by closing a faucet involves an effect like a sledge hammer on the whole network of pipe connected with the line. The longer the column of water put in motion the greater the hammer, which accounts for the excessive hammering at the extreme ends of the line. The remedy for this is found in an air chamber at the principal faucet in each house, which may be made of the same size pipe as the service pipe, and extending 2 feet above the faucet, capped or

closed air tight at the top. This makes an air cushion which gradually arrests the motion of the water when the faucet is suddenly closed, and no water hammer can occur. Water under pressure will, however, gradually absorb the air in the air chambers, when a water hammer will start anew. Then it is only necessary to shut off the service cock of the house and open the faucet under the air chamber, when the water will run out and the chamber will fill with air. Most plumbers understand the need of the air chamber in each house, but it is often neglected or made too small. To show the necessity of a liberal sized air chamber for water works, we may state that at 90 pounds pressure the air that is let into an air chamber 2 feet long above the faucet will be compresed to a length of 3 inches in the pipe, which will answer very well for the shorter distances from the main, but for the ends that have been marked with an X we advise that the air pipe be made 3 or 4 feet long above the faucet, if convenient.

Proposed Plan for Heating a Bathroom.

From S. H. P., Ansonia, Conn.—Will you please inform me if I can heat a bathroom 8 x 8 feet in size by piping it as shown in the sketch presented herewith? Also



Proposed Plan for Heating a Bathroom.

please state whether manifolds or return bends are best for this method of heating? The range which I intend to use for this work is a No. 8 Family Glenwood.

Answer.—It will be necessary to make some changes in the piping before a satisfactory circulation will be secured. In the sketch the return from the radiator connects with the top opening in the water back, which is wrong. The pipe that is intended to take the hot water from the water back to the heating coil makes a drop, which would be a serious impediment to circulation, and it is improbable that the job would circulate if piped as shown. The door between the water back and the bathroom evidently is the cause for this arrangement of piping. To secure a system that will operate it will be better to take out the pipe A B C and connect the return pipe D with the pipe A where it rises, leaving out the pipe E between D and F. At F the pipe should run up to the ceiling and across to the heating coil, where it should drop down and connect with the coil. If the expansion pipe is connected with this pipe at the point where it drops down to connect with the radiator it will have the effect of carrying off any air that might otherwise accumulate in the system and interfere with circulation. The point at which the expansion tank is connected should be the highest point in the system. If the water back is only used for heating the room it will in all probability have ample capacity for the work. The use of return bends would make a longer travel for the water and manifolds would permit a more rapid circulation.

Trouble With Solder in a Copper Tank.

From F. F. H., Woodbury, Conn.—I have lined a tank with copper to hold water coming through a galvanized iron pipe, using half and half solder and acid for a flux. It has been in use for about two years and now the solder seems to be eaten away below the water line, leaving a honeycomb formation which permits leakage. Has any one had a similar experience, and what is the cause? I have lined several tanks in the same way and never have had a similar experience. Who should pay for the repairs—the owner or myself?

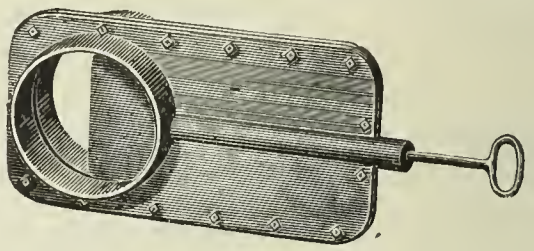
Note.—This letter is evidently addressed to the readers of *The Metal Worker*, and we would be glad if they would answer it. When similar cases have been brought to the attention of *The Metal Worker* we have talked with the manufacturers of solder and have learned that in some instances where solder is sold as half and half, antimony is used to give it the bright appearance that should be furnished by a proper proportion of tin. The result of the use of antimony, even in so small a proportion as 5 per cent., has caused the solder manufacturers considerable trouble, and it is quite possible that the trouble in this case is due to the quality of the solder.

Manufacturer's Address Wanted.

From K. W. G., New York.—Will some reader of *The Metal Worker* please furnish the name and address of the manufacturer of the Orchard gas soldering pot or furnace?

Improved Wind Gate.

The accompanying cut illustrates a new wind gate brought out by Miner & Peck Mfg. Company of New Haven, Conn. It is designed to control and shut off



Improved Wind Gate

the flow of wind in blast forges, cupolas, rolling mill furnaces, &c., and is so constructed, it is stated, that there is no leakage of air. It is made in sizes from 2 inches to 20 inches inclusive. The case is made of cast iron, while the slide is of sheet steel riveted securely to forged handle.

New Publications.

THE ARCHITECTS' DIRECTORY FOR 1897-98. Size, 5 x 6¾ inches; 112 pages; bound in red paper covers with gilt side title. Published by William T. Comstock. Price, $1.

This is the fourth edition of a directory which will be found of value to many in the trade, containing as it does a list of the architects of the United States and Canada, classified by States and towns, with the architectural associations to which they belong indicated against each name. There is also a classified index of manufacturers and dealers in building materials and appliances, thus adding materially to the interest and value of the work for architects and builders. The lists have been prepared with the greatest care to secure accuracy, both as regards names and locations.

Those who contemplate going to the Klondike will be interested in a circular issued by the Yukon Sled Mfg. Company, 107 Weller street, Seattle, Wash., which illustrates and gives prices of the Mascot sled.

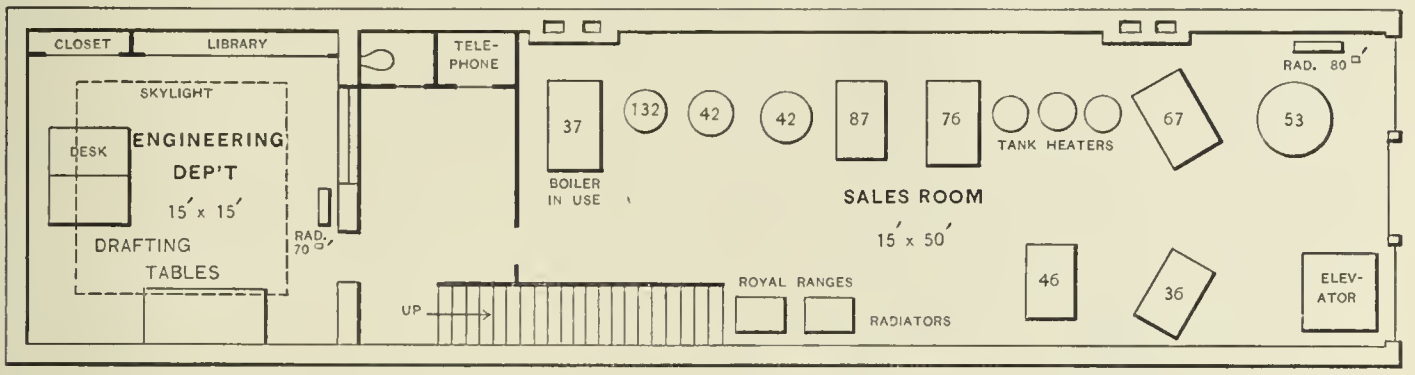
HEATING AND PLUMBING.

HEATING THE HART & CROUSE COMPANY'S SALESROOM.

In many instances the heating contractor is called upon to heat a building, or a portion of it, in which the heating apparatus must be upon the floor that is to be heated. This is particularly true in old buildings where stoves have been used and where there is either no basement or it is unavailable. The problem of circulating hot water through radiators placed on the same level as the boiler is one that has been of great interest to many in the trade, and for some reason is looked upon as a very difficult undertaking. The simplicity of the operation of a properly planned hot water system specially adapts it for such work, though to many it presents new difficulties for solution.

W. M. Mackay, manager of the steam and hot water department of the Hart & Crouse Company, Utica, N. Y., has installed for heating their New York showroom, at 235 Water street, a system of this type which closely resembles in appearance a single pipe steam system, so that those who have not seen a working job of the kind may examine the details when visiting him. For the purpose he has used a No. 37 Royal hot water heater having a grate surface 19 x 24 inches, or about 3 square feet. The arrangement of the heating surface of the boiler is such as to present 63 square feet of surface. This boiler is rated as capable of carrying 520 square feet of direct hot water radiation. In this system there is 290 square feet of surface presented in the various radiators, and in the flow and return mains and branches about 100 square feet of surface more, so that the total radiation which the boiler must carry is about 400 feet. It will be readily seen from this that in this boiler 1 square foot of grate surface is provided in proportion to 21 square feet of heating surface, and that 1 square foot of heating surface in the boiler is designed to carry a little over 8 square feet of radiating surface; but in this case there is but 6¼ feet of radiation to 1 square foot of boiler service. The boiler used is of the vertical sectional type.

Fig. 1 is a plan of the first floor of the building, showing the location of the boiler used and a radiator in the engineering department in the rear and one in the showroom at the front of the building. In order to display different types of radiators an Italian flue radiator presenting 70 square feet of surface is used in the engineering department, and a three-column Triton radiator presenting 80 square feet of surface is used at the front of the building. Fig. 2 is a plan of the second floor, with a three-column Standard radiator presenting 60 square feet of surface in the rear office and a four-column National radiator presenting 80 square feet of surface in the private office of Manager Mackay.



Heating the Hart & Crouse Company's Salesroom.—Fig. 1.—Plan of First Floor.

The piping system may be followed from the view presented in Fig. 3. Two 2-inch mains rise from the header on the top of the boiler, one running to the front, where a 1¼-inch pipe leads to the radiator on the second floor. The return from this radiator is brought back and connected into the 2-inch return pipe. This 2-inch pipe returns all the way to the heater, so that in case the radiator is shut off the circulation will continue. On this 2-inch return, near the first-floor radiator, one of the O. S. distributing fittings made by Oliver Schlemmer, Cincinnati, Ohio, is placed, with the top side down, as illustrated in Fig. 3, to show how a forced circulation can be secured in case of necessity. A 1½-inch pipe leading from this fitting is connected with the first-floor radiator, and the return from the radiator connects into the 2-inch return main. This return pipe connects into a tee immediately below the boiler, with a drip cock at the bottom and the top side connecting with the return header on the heater. The other 2-inch main from the top of the heater connects

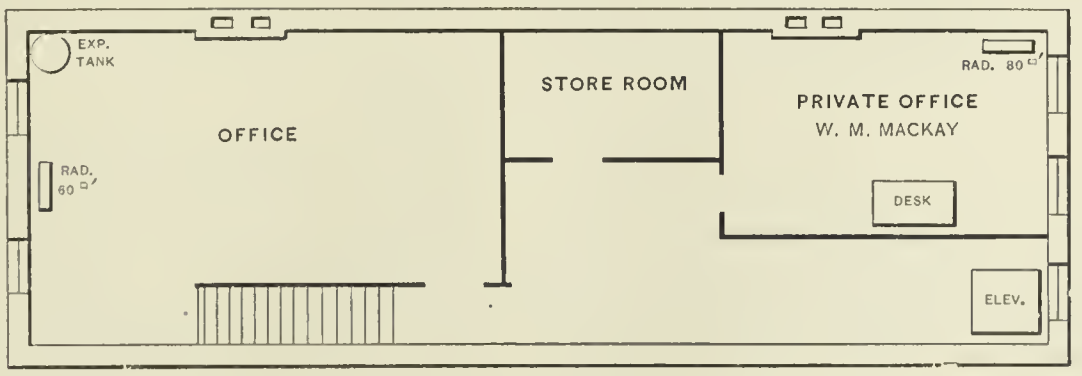


Fig. 2.—Plan of Second Floor.

with a 1½-inch flow leading over to the radiators at the rear of the building. A 1-inch pipe is carried to the second-floor radiator. The main then continues with the necessary turns to a point where it drops down and connects with the radiator in the engineering department on the first floor. The return from the radiator on the second floor connects into the flow main as it continues, so that the flow pipe to the first-floor radiator acts as the return from the radiator on the floor above, and the return pipe from the first-floor radiator serves as a return for both. The return pipe runs to a point beneath the boiler, where it connects with a tee, one side being connected with the header and the other side being provided with drip cock, so that in case of necessity the entire heating system and heater may be emptied.

A 1½-inch pipe from the flow to the radiator on the second floor is carried to an expansion tank, and a ¾-inch connecting with the return from this same radiator is connected with the bottom of the expansion tank to serve as an expansion pipe. The ½-inch pipe is to produce a circulation of water in the expansion tank to show what is considered a proper connection where the expansion tank is placed in an exposed position where it might freeze. An overflow pipe is taken from the top of the expansion tank and carried through the wall of the building. The expansion tank is provided with a gauge glass, so that the amount of water in it can be readily seen at any time.

The water supply to the system is connected with the header on the left side of the heater in the cellar, but in order to show how a boiler system may be filled in cases where there is no supply under pressure, the expansion tank is fitted with a funnel into which water may be poured. The pipe connecting the expansion tank with the funnel is provided with a stop cock, so that when the system is filled the stop cock may be shut off to prevent water being thrown out of the tank through the funnel in cases where heavy firing or bad piping might produce such a result.

In addition to the usual trimmings for automatic regulation the boiler used is provided with a thermometer on the flow and return main in order that the temperature of the water in circulation may be readily seen, and on the front of the flow header is an altitude gauge, so that when the system is once filled and the stationary hand placed in the proper position, the hand which shows the variable pressure will enable the user to see whether the system is full of water or needs replenishing without going to the place where the expansion tank is located and making an examination there. In the case of residences or large buildings in which hot water systems are used the fire tender may always know from the altitude gauge the condition of the water supply without making what would in many instances be a long journey to the expansion tank to secure the same information.

In the arrangement of the sample room a No. 53 Prince Royal combination hot air and hot water heater stands just inside of the door, and just beyond it is a No. 67 Royal steam heater. Next comes a line of three sizes of small hot water heaters for use in heating tanks for storing hot water in apartment houses. Beside them stand a No. 76 and a No. 87 Royal steam heater, and just beyond the No. 42 Royal hot air furnace is shown with a steel radiator and with a cast iron radiator. The next sample is a No. 132 Royal Victor hot air furnace. On the opposite side of the sample room a No. 36 and No. 46 Royal hot water heater are displayed, and beyond them is an assortment of various styles of radiators, and opposite to the Royal hot air furnaces are two Royal kitchen ranges.

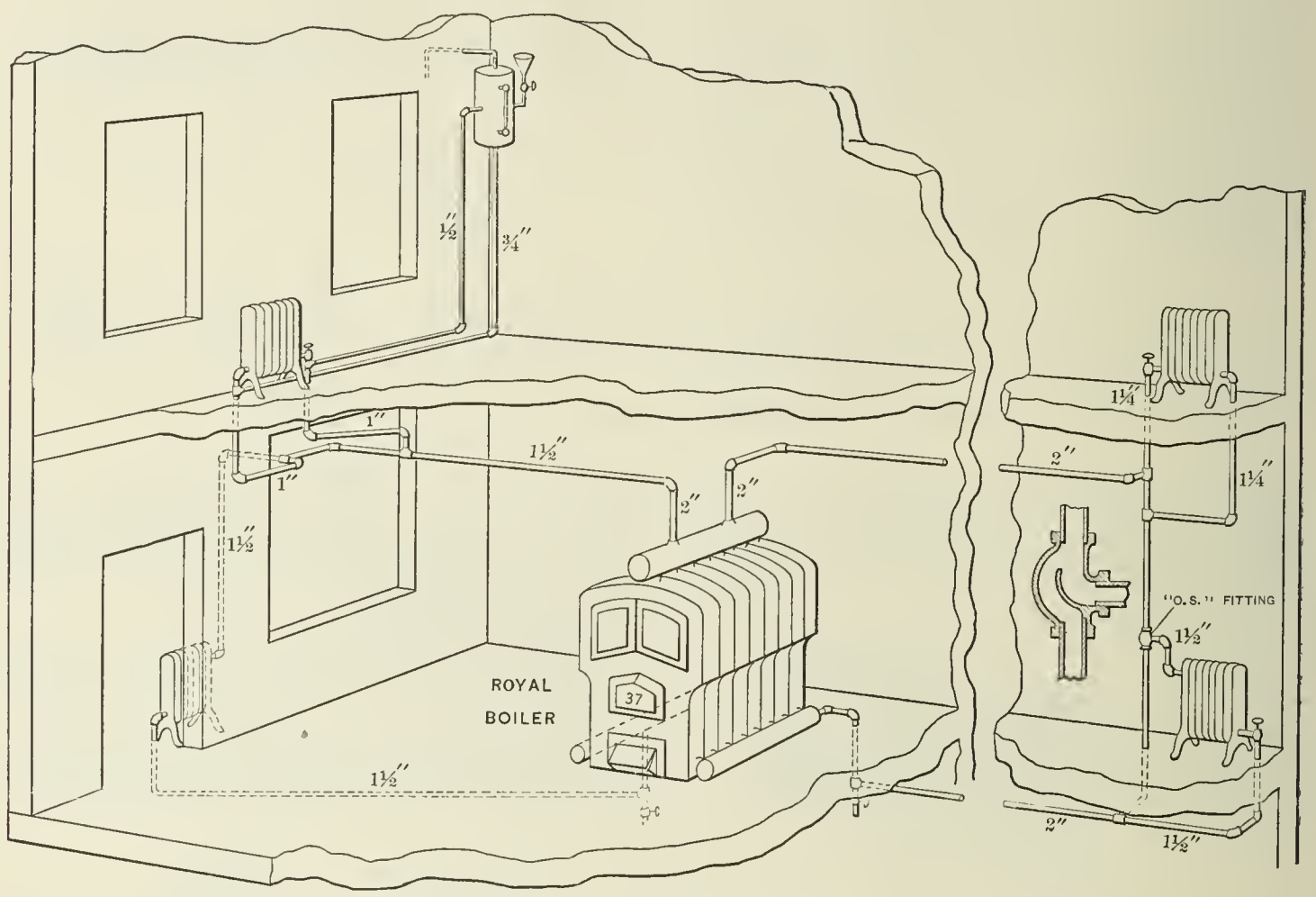


Fig. 3.—View of Boiler and Piping.

The Judson A. Goodrich Company, 120 Beekman street, New York City, are preparing for their representatives a welcome among the trade by the Thanksgiving wishes which are being sent out on a cardboard folder on which are the words "Thanksgiving, 1897," beneath which are the words "We wish thee well." At one end is a picture of a fine fat gobbler, and secured to the card by means of a red ribbon is a wish bone. The inside pages show in a tint a primitive fire place and a country residence. In heavy type are various reasons why thanks should be given, and a request that those who receive the folder should wish for the continued prosperity of the Judson A. Goodrich Company. The last page gives the address of the house and their trade-mark, referring to High Grade Steam Specialties. The folder is incased in a red covering on which reference is made to the house being an authority on High Grade Steam Specialties.

Method of Heating Buildings Where Three or More Stoves Are Now Used.*

Early in the year a circular was sent to the members of the association asking their views on this subject. A number of replies were received, some of which explain the views of the writers so explicitly that we have concluded to give them in full as written. Your committee has been surprised at the view taken by a large number of the members of the circulars sent out by the committee.

George W. Andrews of the Baltimore & Ohio Railroad writes as follows :

" Herewith you will find statement of various methods in use on this road for heating stations. In the small stations we use a No. 2 Alaska stove, at a cost of about $12 set up. In medium size stations we have hot air heaters, which, while they give ample heat, are expensive to maintain. In large stations we have either steam or hot water. The steam is supplied by low pressure steam boilers. In the station at Wilmington, Del., where hot water is used, we have the Perfect hot water heater, made by Richardson & Boynton Company of New York. For economy and general satisfaction I prefer the hot water system. The heater spoken of has been in use about eight years, and has not only given entire satisfaction, but has cost but little for maintenance. We wash it out every spring after fire has been drawn for the season, which is about the only work we have ever done to it. I am aware that many systems of hot water heating have been unsuccessful in the past, which I believe was due entirely to ignorance of the proper application of the principles governing hot water circulation. In the above mentioned heater, as with many others now on the market, due regard has been given to these principles and success has followed. These heaters occupy but little space, and the one we have uses about two tons of coal per month and will heat 40,000 cubic feet of air space."

J. P. Snow, Bridge Engineer of the Boston & Maine Railroad writes as follows :

" The system of heating universally adopted on the B. & M. R. R. is the two-pipe hot water system. For the station at Richmond, Ky., to which you call attention, I would recommend a cast iron boiler of the Richmond, Gurney or Hub patterns, of proper size, placed in a cellar, and radiators giving a surface of about 1 foot to each 35 cubic feet of space in the three waiting rooms shown and in the toilet room and agent's office.

" I would distribute these radiators as well as possible around the room, placing them under the windows wherever practicable. In the baggage room I would run coils, giving about 1 square foot of radiation to 60 cubic feet of space. I would use Detroit radiators having valves and fittings of not less than the following sizes : 1 inch supply and return for radiators up to 40 square feet, 1¼ inch supply and return for radiators from 40 to 60 square feet, 1½ inch supply and return for radiators from 60 square feet upward. I would use flow and return pipes, giving 1 square inch of section to 60 square feet of radiation supplied. I would use an open expansion tank placed above the ceiling, automatically supplied if there is a water service convenient. I would also run a feed pipe to the lowest part of the boiler for filling the system whenever it is emptied. If there is no water supply convenient the tank should be placed as high as possible, but in a position where it can be easily filled by buckets. The above amount of radiation is largely guesswork, as I am not acquainted with the conditions of climate in the latitude specified. In central New England, or at latitude 42 degrees 30 minutes, we use a ratio of 1 foot of radiation to 30 cubic feet of space in waiting rooms and ticket office, and 1 foot to 50 in baggage and express rooms. Further north, or in latitude 44, we use 1 foot of radiation to 25 in waiting rooms.

" Where the radiation is as much as 2000 square feet I should recommend a wrought iron boiler of the Star pattern instead of the cast iron styles specified above.

" The hot water system is expensive in the matter of radiators when first put in, but it is quite economical in coal in moderate weather.

" In the coldest weather the amount of coal used is the same as it would be with steam, but at moderate temperatures, which obtain at least three quarters of the time during which a fire is needed, the hot water system takes decidedly less coal.

" What is known as the Paul vacuum system is, I think, very good for depot heating, although it has not been adopted on our road. It is possible that it may require a little more attention than the system described above. It is essentially a steam plant with a small vapor pipe leading from each radiator or set of coils to an ejector operated by the water supply or some other force which will tend to produce a vacuum. This can be adjusted to work at any desired pressure and its operation is wholly automatic. It is possible to lift vapor from the boiler, which will, of course, give off heat from the radiators when the water is at a temperature of not more than 160 degrees in the boiler. It is then a mere matter of firing to obtain any heat required—the plant being supplied, of course, with a safety valve set to blow at any desired pressure ; the safety valve then governs the upper range of temperature and the vacuum ejector the lower range.

" With the hot water system it is entirely feasible to put on a pressure valve so that it can be run up to any desired temperature. This, however, is not advisable, it being better to put in more radiating surface, allowing the use of a slower fire.

" If I did not want a boiler inclosed with brick and wished to burn coal, wood or coke, the Bromich No. 5 boiler gives very good satisfaction.

" Diameter of boiler, 43 inches ; hight of boiler, 84 inches ; diameter of fire box, 33 inches ; number of 2-inch flues, 210 ; square feet of boiler surface, 185 ; square feet of direct radiating surface, from 1400 to 1900 ; cost, $275 for the boiler.

" I would locate the boiler in the basement, under the baggage room, allowing for space underneath platform for unloading coal and for storage, placing a coal hole in the platform for unloading coal and removing the ashes from the boiler when necessary.

" I would place standard vertical radiators in the ticket office, colored waiting room, and baggage room; also circular radiators in the ladies' and gentlemen's waiting room ; all radiators to have sufficient heating surface for heating each room, located as marked on plan.

" For economy, I would recommend this system. I think you can get more heat from the same amount of fuel. For comfort, you have a steady heat ; for cleanliness, steam heat is far superior, as the boiler is located in the basement ; you do not have coal hods, pokers, tongs and coal shovels to handle ; no stove pipe to take down and clean out ; no stove or stove pipe to polish up ; no coal to carry as when you use stoves."

The following would answer for a general specification for heating this building by steam :

The entire building to be completely warmed by direct radiation, located in the waiting rooms, office, toilet and baggage rooms, connected to a system of steam mains which will be suspended from the ceiling of the cellar.

The main to be connected to a boiler which is to be located in the cellar close to the vertical flue. The steam supply branches to the radiators are to rise to and through the floor and to connect with each of the radiators, inserting in the connection, close to the radiators, a lock shield stop valve, for the purpose of controlling each individual radiator.

The return pipe is to follow the same general direction as that of the steam, and it is to be located on the side wall of cellar near the floor, substantially supported. Branch vertical returns are to connect to each radiator and are also to be provided with stop valves in a similar manner to that described for the steam branches.

To furnish and erect a boiler of any well-known make, such as Toulmin, Gurney or any other equally good pattern, and is to be of ample size to heat the building, in the coldest of weather without forcing.

The boiler to be provided and equipped with the usual set of fixtures, such as steam gauges, try cocks, safety valve, damper regulator, fire tools and all other necessary fixtures to render it complete and ready for steam.

The boiler to be covered in a proper manner with asbestos plaster at least 1½ inches thick, applied over wire mesh.

The boiler to be connected to the vertical chimney by means of a heavy wrought iron smoke pipe, with a pivoted damper in its connection.

To have radiators, located throughout the building, to be of the sectional type, of an ornamental and neat finish. Each radiator to be provided with an automatic air valve of the Onderdonk or Jenkins Bros. patent. They should be distributed as follows : Ladies' waiting room, laides' toilet, small waiting room, office, gentlemen's waiting room, baggage room.

The above radiators are to be of ample capacity to warm the rooms in which they are located to 70 degrees in the coldest winter weather.

After steam has been put on, all of the radiators and exposed piping throughout the building to be neatly bronzed with the best gold or silver bronze color, over a good sound coat of sizing. All the exposed iron work around the boiler and in the cellar to be painted with black asphaltum varnish.

The above represents a complete steam heating apparatus left in perfect running order, with steam on, and would cost in the vicinity of New York about $328.

For the heating of this building by hot water, using the same number of radiators, locating the boiler in the same position, running the pipes in the same general manner as specified for steam, equipping the radiators with valves, &c., including the same guarantee of temperature, &c., would cost about $379.

* Extract of a report by a committee consisting of J. H. Cummin, G. W. Hinman, G. W. Markley, Wm Berry, read before the Association of Railway Superintendents of Bridges and Buildings, at Denver, Colo., October 19-21, 1897.

The approximate amount of coal that would be consumed in the steam heating apparatus would be about 13 tons for a winter of six months, and with careful management the hot water system would consume 10 tons of coal for the same period. This amount would in all probability be reduced if the caretaker of the boiler was careful.

Steam Fitting at the Trade School.

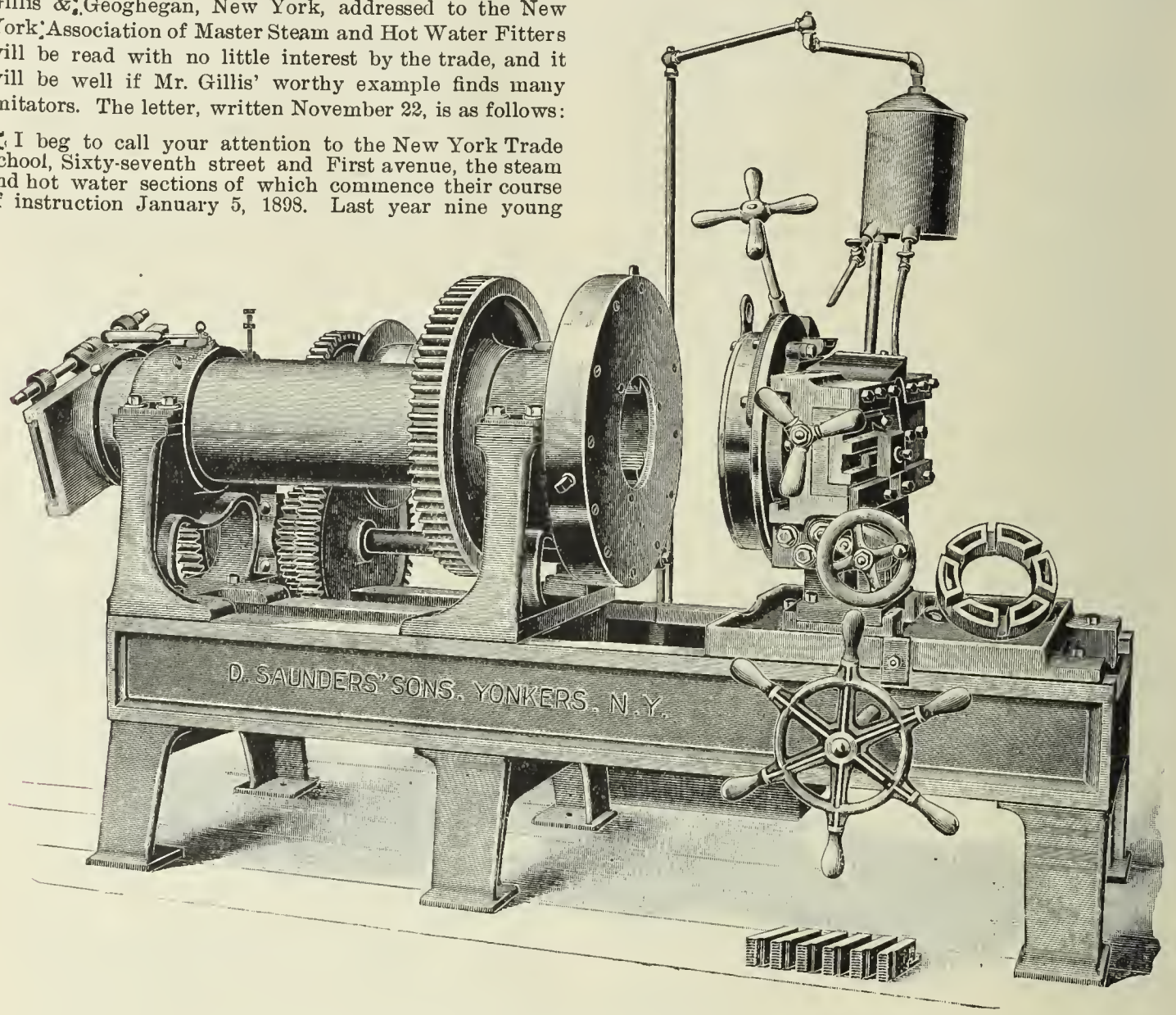
The steam fitting class at the New York Trade School has been a marked success, and it is pleasing to learn that still greater interest is taken in it each succeeding year. It is especially gratifying to note the attention given by some of the prominent men in the trade, and we believe the following letter from Charles J. Gillis of the firm of Gillis & Geoghegan, New York, addressed to the New York Association of Master Steam and Hot Water Fitters will be read with no little interest by the trade, and it will be well if Mr. Gillis' worthy example finds many imitators. The letter, written November 22, is as follows:

"I beg to call your attention to the New York Trade School, Sixty-seventh street and First avenue, the steam and hot water sections of which commence their course of instruction January 5, 1898. Last year nine young men graduated from the class of steam and hot water, six of whom have been heard from and have been at work, for outside of New York and Chicago a graduate can obtain work. I consider the preliminary education obtained in this school to be of such importance that I have agreed to pay the cost of keeping five students there the coming season at $40 each, selecting young men who cannot pay themselves. It is possible the association may think it in their power and desire to found similar scholarships, or that individual members may wish to do it. Mr. Walworth of Boston and Mr. Franklin have consulted me about sending their sons to join the class this season, and Mr. Geoghegan has recorded the name of one of his sons for the same. I should be glad to see 50 or 100 members of the new class, as such a number can be readily accommodated in the splendid buildings of the institution and take advantage of the technical education they will receive.

The above letter was read to the Master Steam Fitters at their regular meeting this week, and the association voted that a gold medal be given to the graduate having the best record at the coming session of the Trade School in the steam heating section.

The Saunders Pipe Threading and Cutting Machine.

The belting and gearing of the pipe threading and cutting machine here illustrated have been arranged with the view of obtaining suitable power and speed for the various sizes of pipe, so proportioned as to give a nearly uniform surface speed for each of the different sizes of pipe. The power of the machine is in the arrangement of the gearing, avoiding the necessity of using large pulleys and tight belts—a difficulty common in such machines. Besides the variations of speed obtained by the cone pulleys, the gearing, which is changed by the movement of a lever, will give the additional speeds and power required for the sizes to be cut. There are no loose gears—all remain on the machine. The cutting head on the carriage is arranged with the die head on front, sliding in ways,



The Saunders Pipe Threading and Cutting Machine—Fig 1.—Front View

which allows the die head to be brought close to the gripping chuck. By this means short pieces of pipe can be threaded without the use of a nipple chuck. After the pipe has been threaded, and to be moved to adjust it for cutting off, or for any other reason, the die head is pushed to one side, allowing the pipe ample room to pass through the cutting head without passing through the die head, to the injury of the chasers by the pipe sliding over them, which is the case when the die head is held stationary in center of ways of the machine. By this arrangement pipe is alternately threaded and cut off without removing the die head from the machine. The cutting off tool is conveniently placed.

The hardened steel V jaws, for steadying the pipe while cutting it off, are moved by a right and left hand screw, thereby centering the pipe. The jaws are adjustable, to compensate for wear. The gripping chuck for holding the pipe is strong and well fitted, provided with independent jaws, permitting of the adjustment of the pipe to the center, and avoiding a common difficulty in the ordinary pipe chuck after it has been used some time. When desired a universal gripping chuck is fitted to the machine in the place of the independent. At the rear end of the spindle is a two-jawed self centering chuck to center the pipe, doing away with bushings or guides.

The die heads are of the adjustable expanding style, cam movement, operated by means of a worm and wheel, releasing the pipe at once when the required thread has been cut, and without stopping or reversing the machine spindle. With the No. 6 machine there is one die head, with a number of sets of chasers, all fitting into the same,

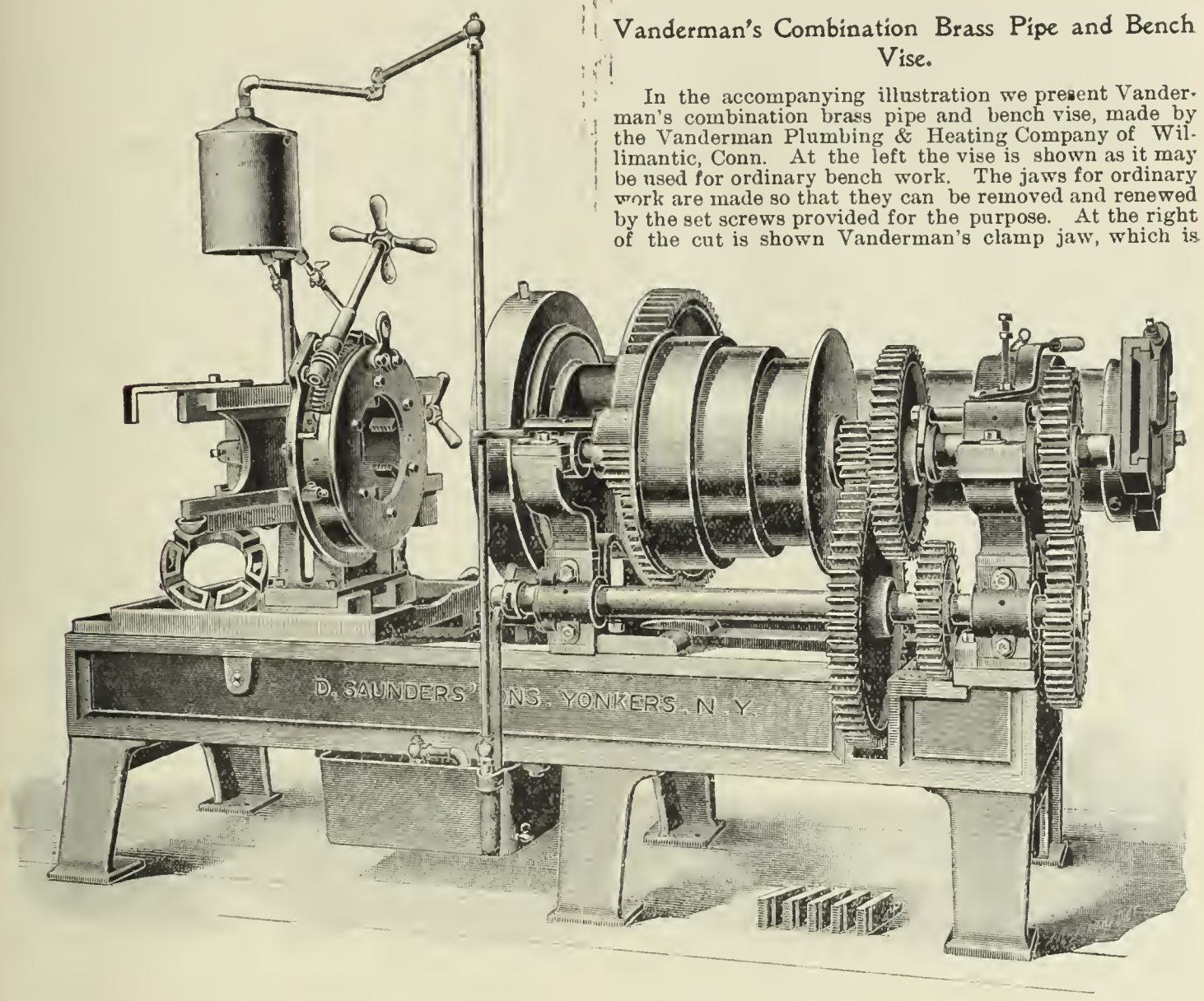


Fig. 2.—Back View.

to thread 2½ to 8 inches, with a set of blank gauges to set chasers to for the different sizes. The No. 5 machine has two die heads, one threading 1¼ to 2 inches, the other 2½ to 6 inches. By having two there is less changing of the chasers, loss of time in changing, and less cost for extra chasers for the small sizes. When the small die head is used the large one is pushed to one side, allowing ample room for the small die head to be brought to the center. The large die head remains on the machine. An automatic oil pump is attached to supply a constant flow of oil to the chasers and cutting off tools. Each machine is fully tested before leaving the works of the manufacturers, D. Saunders' Sons, Yonkers, N. Y.

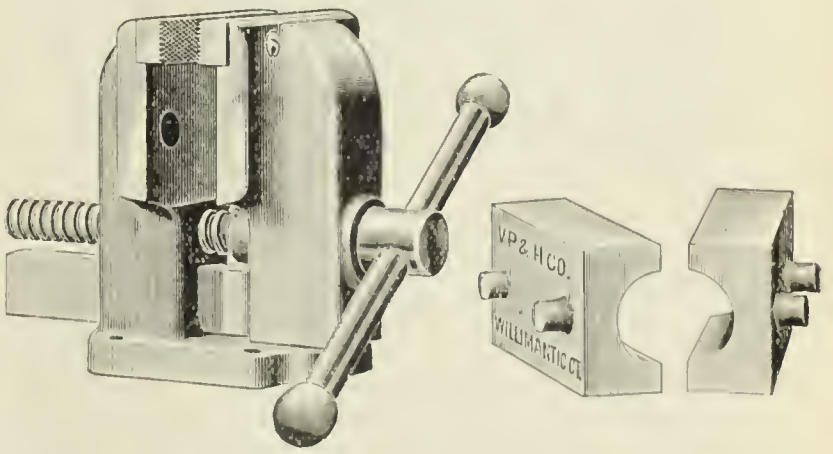
Plumbing and Steam Goods.

A large meeting of plumbing and steam goods manufacturers was held at the United States Hotel, on Fulton street, New York, on Tuesday morning to consider the proposition for better trade protection made at the conference meeting of master plumbers, master steam fitters and manufacturers at the Hotel Windsor last week. After due consideration of the proposition the sense of the meeting expressed in a vote was that it was unnecessary to enter into any new agreement, as they were in accord with the existing resolutions for trade protection.

Sir Henry Doulton, the head of the firm of Doulton & Co. of the Lambeth Pottery Works, London, England, who died last week, is claimed as the pioneer maker of sanitary ware, which he initiated in 1846. He was 77 years of age at the time of his death and began to work as an operative potter at the age of 15. Besides the famous Lambeth potteries, he conducted similar establishments at Burslem, Rowley Regis and Smithwick, in Staffordshire, and at St. Helen's, in Lancashire, and was head of the Sanitary Engineering Works, at Lambeth, England; Paisley, Scotland, and Paris, France. In the course of his career Sir Henry Doulton received 105 gold medals and diplomas and 102 silver medals.

Vanderman's Combination Brass Pipe and Bench Vise.

In the accompanying illustration we present Vanderman's combination brass pipe and bench vise, made by the Vanderman Plumbing & Heating Company of Willimantic, Conn. At the left the vise is shown as it may be used for ordinary bench work. The jaws for ordinary work are made so that they can be removed and renewed by the set screws provided for the purpose. At the right of the cut is shown Vanderman's clamp jaw, which is especially adapted for holding polished brass or nickel plated pipe so that it can be threaded and cut without the pipe lipping and being scarred. Different sizes of clamp jaws are made for the different sizes of pipe, and are provided with lugs for putting in the openings shown in the vise jaws, so that they are held securely in place. They can be readily removed from the vise for inserting another size of jaws or when the vise is to be used for ordinary bench work. The jaws are so cut that they can



Vanderman's Combination Brass Pipe and Bench Vise.

be used for holding ordinary iron pipe without marking the face which comes in contact with brass pipe, and having jaws 5 inches long the bearing for holding the iron pipe makes them efficient in use. A pipe vise of this character will be found of great convenience to plumbers who do both iron and brass pipe work.

Palace King and Queen Heaters.

March R. Story & Sons, 121 Lake street, Chicago, are furnishing two huge warm air furnaces of the Palace King type, built by Russel Wheeler & Son, to the Sixth United Presbyterian Church, Sixty-second street and Woodlawn avenue, Chicago. These furnaces have a 36-inch fire pot, 61-inch radiator and 68-inch casing. The method pursued in heating and ventilating this church is of consider able interest, and we hope to lay the details before our readers in a few weeks. In the shop of Story & Sons a sample has just been placed of the new Palace Queen hot water boiler brought out by Russel Wheeler & Son. Its merits are enthusiastically set forth by C. B. Madison, who represents Russel Wheeler & Son, in the West. It is composed of upright sections, each being independently connected with the flow pipe at the top and the return at the bottom, so that not only can more sections easily be added, but in case of the breakage of one section it can be taken out and replaced without interfering with the operation of the heater. The sections are so built that the flame and products of combustion are drawn to the front of the heater, thence by a port back through a flue made by the tops of the sections, forward again, and back to the smoke pipe, which exhausts the heat thoroughly. A special device is arranged for checking the draft. All the fittings are of the best character. The heater is unusually heavy, so as to insure durability. It is made in a full range of sizes. The same construction is also adapted to steam heating and covers a wide range of sizes.

NOTES.

Higham Bros., Salt Lake City, Utah, bid $1750 and secured the contract for plumbing the county infirmary.

John Hunter, a prominent plumber of Halifax, Nova Scotia, died last week.

Patterson, Gottfried & Hunter, dealers in Machinery, Hardware, Tools and Supplies, 146-150 Centre street, New York, are sending to the trade a puzzle card in the interest of the Fairbanks-Morse Gas Engines. "Is marriage a failure?" is the problem presented for solution, with a group of the fair sex at one side and of the unfair at the other, with intricate paths leading to each, and following the circuitous windings to the end the seeker is liable to a surprise.

The firm of John Getz's Sons, York, Pa., are doing the plumbing work in the Young Men's Christian Association gymnasium. It includes two Combination Shower and Needle Baths.

L. L. Lord, 934 Market street, Meadville, Pa., brings to our notice a circular showing the Lord Taper Reamers, designed for making smooth true holes in stoves, bathtubs and cast iron pipes. The Reamers are made in several different sizes, for making holes ¼ inch in diameter up to 1½ inches.

Thomas Hyde of Albany, N. Y., has been granted permits by the Board of Health to place a new system of plumbing ventilation in a house which he is building.

The Council Committee appointed to hear the charges against Plumbing Inspector Kendrick of Birmingham, Ala., have made a report, which was adopted, stating that the charge of incompetency was totally disproved and the charge of partiality was not sustained.

J. E. Neff of Washington, Pa., is doing a fine job of plumbing in a handsome new residence for Dr. J. S. McCartney.

Allen S. Flitcroft, Ocean Grove, N. J., is one of the busy plumbers at the present time. He has the contract for plumbing the new High School at Ocean Grove, plumbing and tinning a new hotel at Allenhurst, tinning and copper work on a new summer home for James Moses at Spring Lake, besides a number of other heating and plumbing contracts, among which is one for placing a 60-inch Thatcher Furnace in the Page cottage at Allenhurst.

In New England the importance of correct plumbing is brought directly to the attention of the housekeepers by lectures on the subject before the women's clubs and is an example that can be followed throughout the country with advantage. Melvin H. Hapgood recently gave a lecture on plumbing to the Motherhood Club of Hartford, Conn., using the blackboard in illustrating the points brought forward. The general lay out of pipes, vents, inlets and other features of plumbing work in a house was described and sections showing good and bad forms of traps and wastes in water closets, bowls and bathtubs were likewise drawn. Mr. Hapgood strongly recommended the placing of soil and other pipes in sight rather than behind boards or plastering, and gave much other excellent advice.

Albert Brass Works of Brooklyn have been incorporated to manufacture Plumbers' and Steam Fitters' Specialties, with a capital of $10,000. The directors are Charles Steinberg, Minnie Steinberg, Samuel Wasserman of New York City and Thomas C. Roberts Horsfield of Brooklyn.

Articles for incorporation of the Alaska Thawing & Heating Company have been filed at Portland, Ore. The incorporators are Harry K. Greenleaf, Charles E. Potter and John C. Hollister. The company have a capital stock of $25,000.

The Plumbers' Metallic Joint Company have been organized at Portland, Maine, for the purpose of manufacturing and dealing in Pipe Couplings and Plumbers' Supplies. The incorporators are Morris Ebason, Salem, Mass., president, and Thomas Davey of Lynn, Mass., treasurer.

James Hewson will move his plumbing establishment to a store in the new Langbehn Building, on Fifteenth street, Moline, Ill.

E. E. Horton, one of the representatives of the Thatcher Furnace Company, New York, informs us that Thomas Pierce, Canton, Pa., has contracted to heat the residence of M. Landon with an Empire Steam Heater.

The plumbers of Lansing, Mich., have been notified by the Water Commission that no permits will be issued hereafter to plumbers who have not yet taken out a license.

O'Neill & Blackall, plumbers and Stove dealers, at Montpelier, Vt., have dissolved partnership. Mr. O'Neill will continue in the plumbing business and their stock of Stoves has been purchased by George H. Whitney.

James Tate, Mansfield, Ohio, bid $1000 and secured the contract to heat the Deal House, at Bucyrus, by steam.

Fryer & Bathazar, 143 Centre street, New York, are meeting with a good demand for their Simplex Valve for hot water heating, which saves the fitter considerable time and material.

A. H. Meal has been granted a plumbers' license at Guthrie, Okla.

Charles Kieser is about to open a plumbing shop in Newtonville, Mass.

The Richmond Stove Company, 85 Centre street, New York, have just completed a rearrangement of the samples in their showroom. They have added one of the largest size Sectional Steam Heaters, which has a fire chamber 36 inches wide. These sample boilers are all painted sage green, while the new 0 and 900 series of Water and Steam Heaters are painted a bright red.

Contracts for the erection of the central heating plant of the Northern Asylum, at Newberry, Mich., have been awarded to the L. J. Mueller Furnace Company of Milwaukee for $13,225.

F. Bailey and Floyd Kemp have lately opened up in the retail Hardware, Builders' Supply and Plumbing business at Trenton, Mich. The style of the new firm is F. Bailey & Co.

The Secretary of the Treasury has advised collectors of customs at ports in the United States where works of manufacturers engaged in the smelting or refining of metals from imported ores are bonded, that as the tariff act of July, 1897, differs from the act of 1894 it is deemed advisable to require the rebonding of such works. Under the Wilson law it was provided that each day a quantity of refined metal equal to the amount of imported metal smelted or refined that day should be set apart and should not be removed from the works except for transportation to other bonded premises or for exportation. Under the new law it is provided that a quantity of the refined metal equal to 90 per cent. of the amount of imported metal smelted or refined shall be set aside each day. In the new tariff it is required that lead ores imported and refined shall either be exported or entered for consumption within six months from the date of the receipt of the ore. Under the old regulations no limit of time was fixed.

A correspondent at San Francisco, Cal., writes: "The Klondike fever is epidemic now in San Francisco and the coast generally. Estimates of the number of people who will find their way there in the spring vary all the way from 50,000 to 200,000, but your correspondent goes below low water mark even and places it at 30,000. This will give rise to a great trade, and it is safe to say that $30,000,000 will be spent. San Francisco merchants are taking steps to see that the major part of it comes their way. The time that it takes a vessel to get from San Francisco to St. Michaels at the mouth of the Yukon is almost exactly the same as from Seattle, our great rival. There will be a great trade with the North here next year, and a large portion will consist of Hardware, Machinery and Iron utensils of all descriptions, Picks, Shovels and the thousand and one little odds and ends which are necessary even in a mining camp."

TIN PLATES.

Tin Plate in Pennsylvania.

We are indebted to James M. Clark, Chief of the Bureau of Industrial Statistics, for a copy of Part Three of the Annual Report of the Secretary of Internal Affairs of Pennsylvania, giving statistics for the year 1896. Considerable prominence is given to the tin plate industry in Pennsylvania, and the analysis at the end of the book presents the following summary of the tin plate figures. The first relates to wages, and is as follows:

There are 303 persons considered, including 14 boys and 8 females. Their average earnings were $669.98. It must be understood that these statistics are taken from black plate works and not from dipping works, but that this average includes the labor in making the plate and in tinning it.

	Average yearly earnings.	Ranging from		Highest monthly earnings.
18 rollers	$1,852.69	$1,387.88 to	$2,802.44	$383.77
6 rollers and doublers	1,350.87	750.13 to	2,198.84	397.08
17 rollers' helpers	560.36	414.52 to	836.98	114.63
22 heaters	1,057.20	472.04 to	1,948.60	234.80
3 pair heaters	254.19	236.09 to	268.20	49.29
19 doublers	1,333.09	660.05 to	1,864.33	258.65
6 annealers	688.68	320.27 to	1,259.00	140.00
6 annealers' helpers	397.12	247.41 to	564.80	50.50
8 assorters (females)	198.43	119.02 to	245.50	26.00
6 wet loaders	329.09	217.89 to	384.51	37.00
3 openers	377.92	336 07 to	401.82	46.70
3 W. P. openers	393.32	294.59 to	508.18	64.80
8 shearmen	833.44	372.81 to	1,731.36	302.97
4 riggers and shearmen	488.38	439.80 to	547.67	60.85
8 tin stack workers	600.33	345.71 to	1,020.61	127.90
5 gasmen	729.56	483.15 to	1,140.00	180 00
7 engineers	588.42	429.65 to	686.20	76 50
5 firemen	444.26	341.55 to	503.78	47.90
4 machinists	738.28	621.00 to	814 33	82.81
3 coal heavers	473.44	403.31 to	533.97	54.90
13 laborers	383.33	215.57 to	590.09	83.75

One "cold rolls" is found to have had earnings of $1167.80; highest monthly earnings, $112.50. Two blacksmiths earned, respectively, $519.34 and $765.25, with daily wage of $1.75 and $2.50.

The second section in the analysis relating to tin plates gives statistics of production, and is presented in full here with:

It will be noticed in the black plate works that 12 establishments are considered, and that they cover the entire production of black plate in Pennsylvania for 1896, with the exception of 100 tons for which no statistical return was made. Including this 100 tons the total production of black plate for 1896 was 158,306,490 pounds, as against 104,757,360 pounds produced in 1895, an increase of 53,549,130 pounds, or over 50 per cent. Of this production 97,814,762 pounds was tinned, as against 49,502,000 pounds tinned in 1895, or nearly double the quantity. The value of the entire production tinned and untinned in 1896 was $4,633,161, as against $3,252,924 in 1895. The average value of the tinned production in 1896 was $64.56 per net ton, and for the black plate untinned, $48.94. There were 3144 persons employed, as against 2474 employed in 1895, with an average number of days of employment of 254, as against 229 in 1895; average yearly earnings, $456.55, as against $429.95 in 1895; average daily wage, $1.80, as against $1.87 in 1895.

The number of dipping plants in operation was 3 less than in 1895, there being but 14 in 1896, and there being 17 in 1895; number of persons employed, 477, as against 557 in 1895; number of days in operation, 240, as against 244 in 1895; average yearly earnings, $281.63, as against $337.92 in 1895; average daily wage, $1.17, as against $1.38 in 1895. Their total production of tin plate was 41,773,941 pounds, as against 54,873,636 pounds produced in 1895, a decreae of 13,099,695 pounds, or nearly 24 per cent. Value was $1,888,398, as against $2,463,494 in 1895, a decrease of $575,096.

The black plate and dipping works combined had a total product of tin and terne plate of 139,588,703 pounds, or a total production, including the 60,491,728 pounds black plate not tinned, of 200,080,431 pounds, as against 159,630,996 pounds produced in 1895, with a total value of $6,520,559, as against $5,716,418 in 1895.

Pennsylvania still holds her place as the largest single plant producer of tin plate in the world.

The Witte Hardware Company, St. Louis, Mo., are making a specialty of American Tin Plate, which they are handling in large volume. The brands of Bright Tin, specially manufactured for the concern and handled by them, are Juno and Hero. Ajax and Hercules are the names of the company's special brands of Roofing Tin.

SCRAP.

Harry Herbert has assumed the position of manager of the new tin mills of the Neshannock Sheet & Tin Plate Company, New Castle, Pa. Mr. Herbert was the first superintendent of the New Castle Sheet & Tin Plate Company's plant, but resigned to accept a position at Montpelier, Ind. Of late he has been manager of a large Tin Plate plant in Ohio, which position he has relinquished to take charge of the Neshannock plant. Before leaving his last berth he was presented with a handsome gold headed cane and a silver match box from the employees of the mill. Mr. Herbert has had a large experience in building tin mills and getting them into working order.

The first seizure of contraband Tin Plate since the industry was established in the United States was made last week at Passamaquoddy, Maine, by the special Treasury agent of that district. It consisted of 20 boxes, which were seized, together with the schooner which conveyed the goods from St. John, N. B. The boat and the Tin Plate will be sold to the highest bidder, in accordance with the law.

We are advised by the Humbert Tin Plate Company, Connellsville, Pa., that they have leased the Tin Plate plant of the Stickney Iron Company, Baltimore, Md., and will operate the same under the name of the Humbert Tin Plate Company. Their output will consist of Coke Tin Plates under the brand name of Humbert.

A little 16-page pamphlet distributed by the E. E. Souther Iron Company, St. Louis, Mo., is devoted to their special brands of Bright and Terne Plates. These are: Calla Lily, Daisy and Honeysuckle, Bright Plates, and Black Hawk, Buffalo and Arrow, Ternes. All these Plates are made of best American steel and coated by the palm oil process. A description of the method of tinning by the oil process is given, and also of the acid tinning process, showing the advantages of the former over the latter. The pamphlet also contains price-lists and descriptions of the company's Tin Flashings, Tin Valleys and Gutters, Stove Pipe Stock, One-Piece Corrugated Elbows, Peerless Adjustable Elbows, and Samson's Four-Pieced Elbows, as well as Reliable Peerless Stove Pipe.

A San Francisco, Cal., correspondent writes under date of November 8: "We have been receiving Tin Plate during the fortnight, though not in any very large quantity. We had, however, five cars, or 169,170 pounds. Of course this is not the season and the only effect of the importations is to add to the stock in hand."

Some samples of American M. F. Terne Plates, made at the works of the Ellwood Tin Plate Company, Ellwood City, Pa., were to be seen this week in the office of a New York City jobbing house. The Plates were critically inspected and tested by a number of handlers and consumers of the Welsh M. F. Plates and were generally admitted to be fully up to the standard of that famous brand of Roofing Tin. The only difference seemed to be that the coating of the American product is somewhat smoother than the Welsh. The Ellwood Tin Plate Company are said to be well furnished with orders for M. F. Plates for near and future delivery.

A considerable increase in the capital stock of the United States Iron & Tin Plate Mfg. Company, at Demmler, Pa., will be made. As already noted, this concern at present have some very extensive additions to their plant under way.

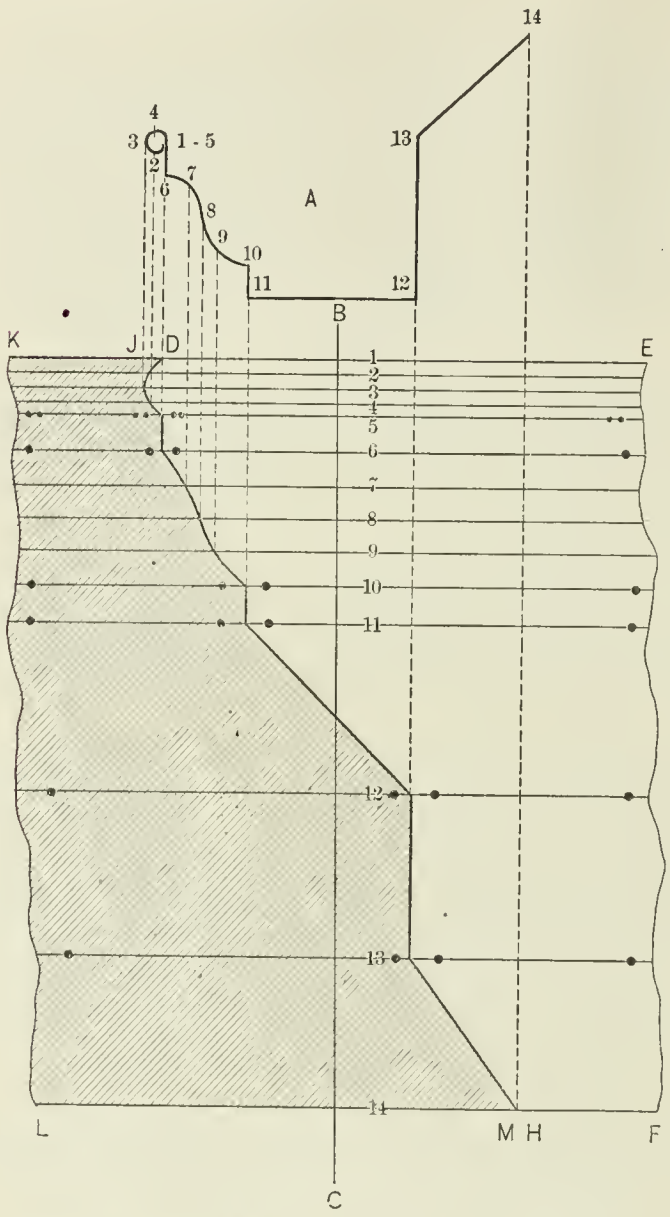
Samuel Trethewey & Co., Limited, Pittsburgh, Pa., manufacturers of Solid Steel Shear Knives and Rolling Mill Machinery, are adding considerable machinery to their equipment to meet the demands of their growing business. This concern are running their works full time, and have recently made several shipments of Rolls to England.

The Ellwood Tin Plate Company, Ellwood City, Pa., have added considerable machinery to their equipment to accommodate the additional demand for their Plate caused by the acquisition of MF brand of roofing Tin. At the present time they have formed no definite plans for further extensions.

SHEET METAL WORK.

Outside and Inside Miters.

A correspondent in Sedalia, Mo., asks us to inform him through *The Metal Worker* how to draw outside and inside miters for hanging gutter.



Outside and Inside Miters.—Fig. 1—Section and Patterns.

Let A in Fig. 1 represent any section of a hanging gutter. Divide the profile, including the bead, into any convenient number of equal spaces. At right angles to 11 12 draw a vertical line, B C, upon which place the stretchout of the hanging gutter, as shown by the small figures. At right angles to B C, and through the small figures, draw lines which intersect with those of corresponding numbers drawn from the spaces in the profile A at right angles to 11 12. Trace a line through the points of intersection thus obtained, as shown by D H. Then will D E F H represent an outside miter for an exterior or outside angle, shown in Fig. 2 by A B, and the reverse or shaded portion, J K L M, in Fig. 1, an inside miter for an interior or inside angle, shown by C D of Fig. 2. No matter what outside miter is obtained at any angle, the reverse, or that portion of the miter falling off, is always the inside miter at the same angle.

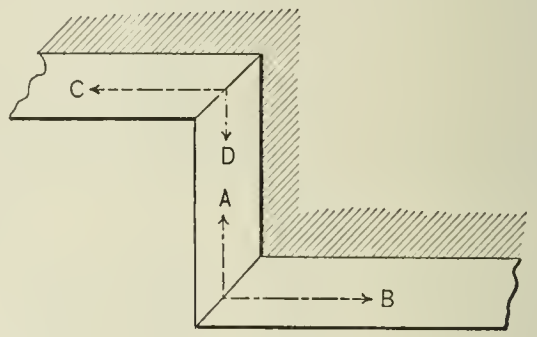
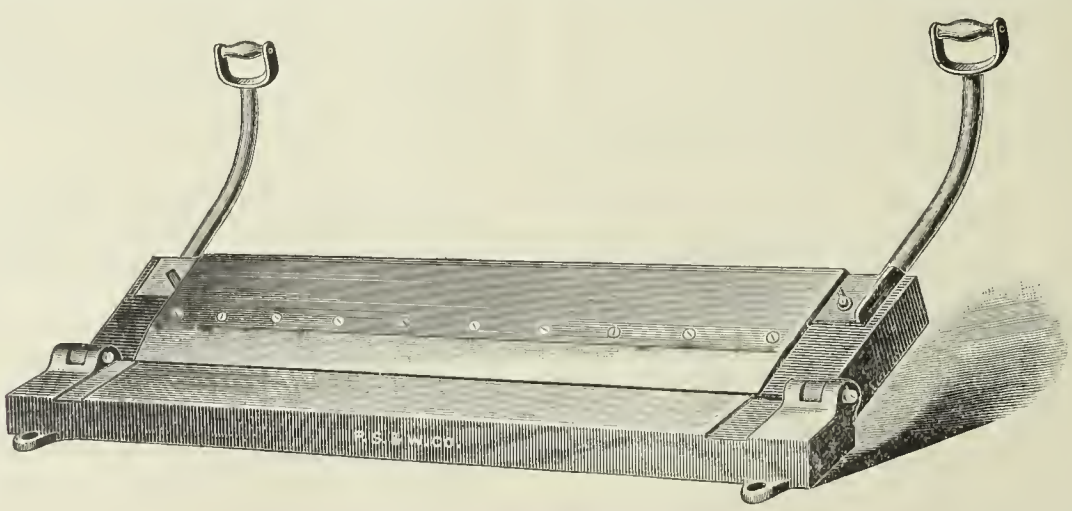


Fig. 2.—Diagram Showing Outside and Inside Miters.

Stow's Improved Sheet Iron Folder.

The Peck, Stow & Wilcox Company, 27 Chambers street, New York, have put upon the market an improved form of Stow's sheet iron folder for heavy work, as here illustrated. There is a handle at each end and a gauge for regulating the width of lock from ¼ to 2¼ inches inclusive. Any suitable angle can be formed on iron as heavy as 20 gauge, and if necessary machines can be furnished to turn wider locks. They are numbered 25, 30 and 35, with capacities of 42, 48 and 60 inches, the machines weighing 290, 325 and 400 pounds respectively.



Stow's Improved Sheet Iron Folder.

FLASHINGS.

In the report of industrial statistics of the State of Pennsylvania, which we received from James M. Clark, chief of the bureau, giving the statistics for the year 1896, we find the following figures relating to the slate industry. The figures are based on returns from 39 concerns, the total value of their production amounting to $1,491,575, the average number of wage earners being 2923 and the aggregate wages received $867,175, being an average daily wage of $1.27. These figures include roofing slates, school slates and other products.

We are informed by the Burgess Soldering Furnace Company, Columbus, Ohio, that any one having Gem Gasoline Soldering Furnaces that are not up to date can make them so at a small cost by adding their new Generator and Drip Cup, which is said to generate without noise, smoke or odor. To attach the same it is simply necessary to drill two holes below the front resting plate

and bolt the cast iron bracket to it. This improvement can be sent by mail, and all who are interested in it should write to the manufacturers for prices and particulars.

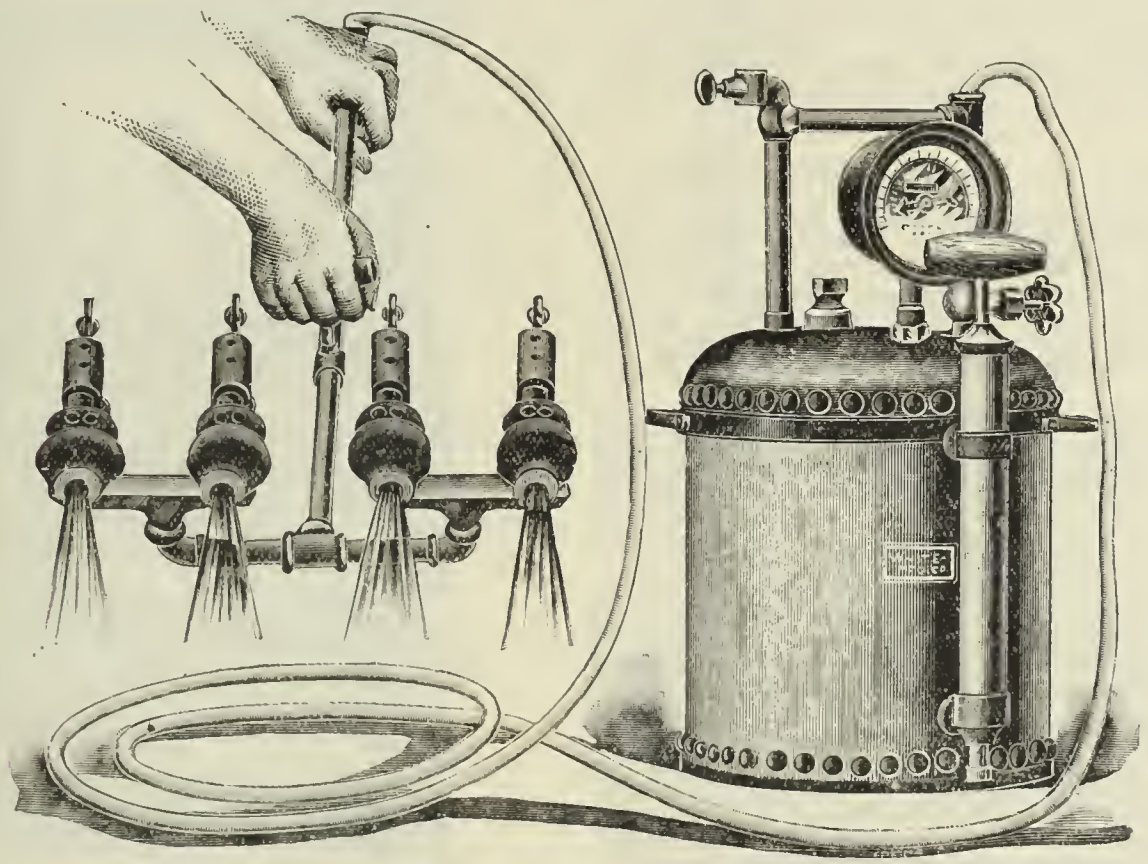
The American Corrugating Company, St. Louis, are meeting with remarkable success in marketing their American Metallic Lath. The points of superiority claimed by this company are stiffness of sheet, economy of plaster, efficiency of key, depth of corrugations, simplicity and speed in working. Their shipments extend to all parts of the country, and they are in receipt of numerous letters of recommendation from the trade and those who have used this lathing.

R M. Clough, who manufactures an extensive line of Shears, Presses, &c., has removed from New Haven, Conn., to Tolland, Conn.

The new co-operative Sheet mill at Scottdale, Pa., will be operated under the name of the Old Meadow Rolling Mill Company.

The Klondike Kerosene Burner.

The special requirements of the Klondike gold fields have called forth new adaptations of apparatus originally designed for other purposes. A curious instance of this is found in the accompanying illustration, which represents



The Klondike Kerosene Burner.

a machine for quickly thawing frozen ground, an operation which is necessary in placer mining in the Arctic regions. Full descriptions of the principle on which this burner is constructed have previously appeared in these columns. It is the invention of John P. Dupee, who has brought out a long line of devices for use in furnaces adapted to the needs of tinners, plumbers, electricians, bicycle makers and other metal workers, all of which are manufactured by the White Mfg. Company, 42 State street Chicago. The Klondike device, although intended for heavy work, is in portable form, so that two men can easily carry it. A galvanized metal tank holds five gallons of oil and is equipped with an air pump and a pressure gauge. A hose connects the tank with the burners, which are four in number, mounted on a frame that can easily be held in the hand and directed at the operator's pleasure, so that the flame can play downward, sidewise or upward as necessary in melting ice, snow or frozen earth. The burners have individual valves, so that they can be run independently. A feature that will be particularly appreciated so far from civilization is that these burners are not likely to get out of order. The generator is not superheated, so that no clogging takes place from carburization. The hose can be furnished in any length desired, but the standard length is 6 feet. The apparatus can be used under a tent or other inclosure instead of the open air. While kerosene is the fuel recommended, gasoline can be burned equally well if more conveniently obtained. A test of this burner has, it is stated, reduced to water in 15 minutes a cake of ice 18 inches square and 10 inches thick. The company have, we are advised, booked some large orders for these burners from Klondike miners.

Only 13 tons of Black Plate were exported from Great Britain to the United States in October last, as against 184 tons in the corresponding month of 1896 and 740 tons in October, 1895. Meanwhile the total British exports of Black Plate have swelled materially. For the first ten months of 1897 they amounted to 50,185 tons, as compared with 41,332 tons in 1896 and 28,376 tons in 1895. This growth, however, seems to have been largely at the expense of the trade in finished Tin Plate, for it is noted that this year's shipments of Black Plate have been largest to the countries—the United States excepted—to which there has been a falling off in the shipments of Tin Plate. Russia, Germany and Italy are all dipping and finishing British Black Plate to a large extent.

Difficulties are being met with in the Welsh Tin Plate trade with regard to the resumption of work by the mills upon the 15 per cent. reduction in wages agreed to by the union. At Llanelly, Briton Ferry and elsewhere the "behinders" and "risers" have declined to accept the lesser reduction of 10 per cent. that had been agreed upon elsewhere, and, while refusing to work, they are attempting to coerce those who have already accepted the terms to break away from their agreement. This is likely, says the *Iron and Coal Trades Review*, to prolong the stoppage of a large number of works, and it is stated that there is an inclination on the part of the men to withdraw from the 15 per cent. reduction. If they persist in this it will mean a general lock out, unless wiser counsels prevail. It was thought that after the Tin Platers' Union had passed a resolution to accept 15 per cent. as a uniform reduction there would be no further demur on the part of the men and no unnecessary cessation of work. The orders for Tin Plates continue to be scarce, and a large number of works are now dependent upon Black Plate and Sheets.

Clarence F. Chatfield, Owego, N. Y., is making a specialty of writing advertisements for manufacturers and dealers, designed especially to fit each individual case according to the data supplied by each client. They may be type matter only or accompanied by illustrations, there being 1000 to choose from. On application suitable literature will be sent quoting rates, &c.

The Michigan Pipe Company, Bay City, Mich., issue a circular calling attention to their wooden pipe for chain pump tubing, also for tanners' and distillers' use, chemical works and casing steam pipes. They are manufacturers of the improved Wyckoff water pipe for distributing water in towns.

THE RETAIL STORE.

Benjamin F. Dunham.

Benjamin F. Dunham, president of the Dunham, Carrigan & Hayden Company, San Francisco, Cal., died in that city November 11. Mr. Dunham was born in Plymouth, Mass., in 1830. He left the old home for Boston, about 1850, and entered the employ of Butler, Keith & Hill, at that time one of the leading hardware houses in New England, and there with hard work and close application he laid the foundation of his later success.

In 1853 he went to California, entering the employ of Hooker & Co., Sacramento, and from there, in December, 1859, to San Francisco, connecting himself with Conroy & O'Connor. In 1872 he was admitted to an interest in the house, together with two of his fellow clerks, Brace Hayden and E. W. Playter, and the firm name changed to Conroy, O'Connor & Co. In 1875 the Conroy & O'Connor interest was sold out to the junior members, including Andrew Carrigan and William McCormick, and the business continued under the name of Dunham, Carrigan & Co. In 1888 the business was incorporated as Dunham, Carrigan & Hayden Company, with Mr. Dunham as president, which position he held until his death.

Sensation in the Chicago Hardware Trade.

The wholesale Hardware firm of John Alling & Co. 53-55 Lake street, who have done business in Chicago under various firm styles since the '50's, have been absorbed by Hibbard, Spencer, Bartlett & Co., who have also done business in Lake street since the '50's. The sale took place nominally on the 12th, but the Alling firm will not be merged into their big rival until December 1.

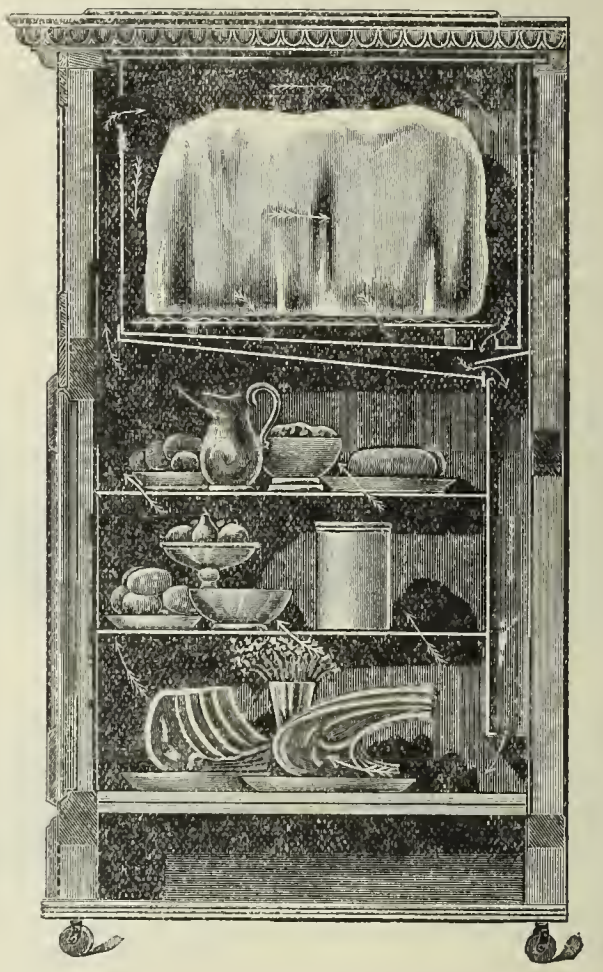
The proposition to sell out was made and concluded practically within two days. The employees of John Alling & Co. knew nothing of the sale until they were notified that the business would be closed up on December 1. R. A. Scovel, a junior member of the Alling firm, probably will go over to the Hibbard firm in some capacity, as will a number of the employees of the former firm.

The firm of John Alling & Co. are composed of John Alling, Simeon H. Crane (Mr. Alling's brother-in-law), and R. A. Scovel. The firm have been doing business in Lake street under various styles for many years. Only one firm besides that of Hibbard, Spencer, Bartlett & Co. now remain who date further back. They are Edwin Hunt's Sons. The latter firm were founded in 1847, and are the oldest Hardware firm in the city. Mr. Alling succeeded John S. Buchanan & Co. 32 years ago. Simeon H. Crane and R. A. Scovel were employees at the time, but came into the firm a few years later. The original firm of John S. Buchanan were established about ten years prior to 1865. These two firms and William Blair & Co., who a few years ago changed to Horton, Gilmore, McWilliams & Co., were the pioneers in the Hardware business in Chicago. They began doing business in Lake and South Water streets when there were few stores anywhere else, and they have stuck to their old locations and brought the rest of the Hardware business of the city close by.

William G. Hibbard started in business in 1855. The firm were known as Tuttle, Hibbard & Co. The name of Spencer was incorporated into the firm in 1865, and the firm took their present style in 1871, when A. C. Bartlett became a member.

Eclipse Cleanable Refrigerator.

One style of the Eclipse cleanable refrigerator made by the Eclipse Refrigerator Company, Burlington, Vt., is shown by sectional view in the accompanying illustration, the removable parts being in place and the cold and warm air currents, giving, it is pointed out, a positive circulation, are indicated by the arrows. The special feature claimed for this refrigerator is that it has a removable tank and at the same time it has a positive circulation of dry air. It is provided with a rear flue through which the cold dry air enters at the bottom of the provision chamber, thus going under all moisture and odors from the food and creating a circulation upward and over the ice. The ice chamber is constructed so that an unusually large ice capacity is afforded which makes a saving in the ice, and better preservative results are obtained. The refrigerators are lined with zinc, all joints soldered, while the walls are constructed with well insulated dead air spaces. One side of the frame is covered with tough heavy sheathing paper, made specially for the company, and the other with stout felt paper, forming one or more dead air spaces according to the size of the refrigerator, covering all joints and nail holes and making a tight wall. The refrigerators are finely finished in hard woods, and are mounted on ball bearing casters. They are provided with a swing base in front, which swings either in or out, and when in the former position is caught by a spring, which is alluded to as a very convenient arrangement for sweeping. The ice rack of the refrigerator is made of bright, galvanized or corrugated steel, riveted to cleats in such a way as not to prove an obstruction to the circulation under the ice or to free drainage to the waste pipe. The Eclipse line includes plain and ornamental refrigera-



Sectional View of Eclipse Cleanable Refrigerator.

tors and ice chests in hard wood for families and grocers' use, and while it is a new one only just put on the market, the orders, we understand, are coming in for them quite freely. The firm issue a 40 page 1898 catalogue, profusely illustrated, and giving all necessary particulars of the Eclipse refrigerators. The trade will be interested in securing a copy of this publication, which will be sent on application.

Erie Aluminum Ware.

"Erie Aluminum Cast Ware" is the subject of a dainty catalogue and price-list just issued by the Griswold Mfg. Company, Erie, Pa., showing, among other articles, several new goods in cast aluminum recently put on the market by the company. The former line made by them is shown to have been improved by the addition of ebony handles, and other novel and useful points have been introduced. Special attention is called to the new line of aluminum hotel ware, and the announcement is made that other articles are about to be added. The present catalogue embraces coffee and tea pots, five o'clock tea kettles, water pitchers, chafing dishes, baking dishes, waiters, dippers, ladles, spoons, salt and pepper shakers, tea kettles, skillets, griddles, saucepans, cuspidors, soap dishes and aluminum house numbers in large variety. Every piece is guaranteed perfectly made and

cast from best No. 1 aluminum. The get up of the publication is very tasteful, the cover being dark green with silver lettering, bearing on the front the well-known "spider" trade-mark of the Griswold Company. The inner pages are printed in green, with attractive half-tone illustrations. The concern anticipate a large trade in their cast aluminum goods for the holiday season. The Griswold Mfg. Company are represented in Europe by Louis Leakey, 127 Farringdon road, London, E. C., England.

Efforts to Secure a Consolidation of Enameled Ware Interests.

Reports have been given currency in the daily press in regard to the attempt to bring manufacturers of enameled hollow ware into a strong organization which will have control of the market. These reports are many of them greatly exaggerated, both in regard to the scope of the movement and the progress which has been made in carrying it out. Negotiations are undoubtedly pending having for their object the unifying of the interests of a number of the enameled ware manufacturing companies of the country. Several representative men identified with Eastern interests of this character recently visited St. Louis for the purpose of inspecting the plants of the St. Louis Stamping Company. Ex-Congressman F. G. Niedringhaus, now head of the St. Louis Stamping Company, is taking a prominent part in the negotiations, and it is believed will be the president of the new company if the projected plans materialize. Nothing definite has been actually determined as yet, but there is good reason for believing that such a movement is contemplated. Among the producers of enameled ware likely to be concerned in the undertaking are several in Chicago, New York and other parts of the country. It is reported that the manufature of tinware may also be covered by the new company. There are several important concerns who, while friendly to the movement and favorable to such an amalgamation of interests, because of its effect on the market in diminished competition, say definitely that it is against their policy to enter into such a combination. Further developments will be awaited with interest.

Detachable Handle Coffee Pot.

Manning, Bowman & Co., Meriden, Conn., and New York, are putting on the market detachable handle tea and coffee pots, one of the former being shown in the accompanying cut. With the detachable handle the pot may be placed on the stove and the handle at once detached to prevent injury from the heat. The handle can

Detachable Handle Coffee Pot.

then be used with comfort when the tea or coffee is ready to be served. In connection with the detachable handle the pots are provided with an asbestos cushion, so that the best pots may be placed on any gas or oil stove as well as on a stove or range.

"The Best" Wrench.

The accompanying illustrations represent the various uses to which a new combination tool can be applied

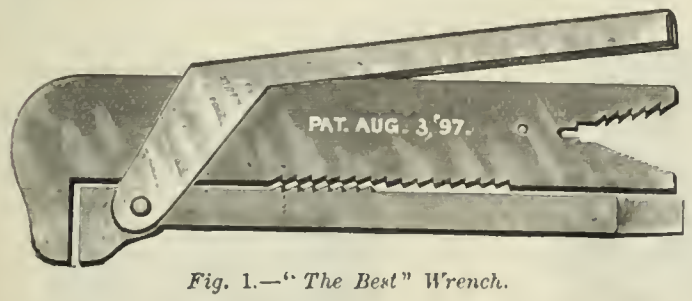


Fig. 1.—"The Best" Wrench.

which has been brought out by the Best Wrench Company, 21 Quincy street, room 602, Chicago. Four complete tools are combined in one—namely, an adjustable wrench, Fig. 1, an alligator wrench and nipple wrench, Fig. 2, and a screw driver, Fig. 3, thus forming a very desirable set for bicycle use as well as other purposes. The length of the tool when closed is 5 inches and its weight is 4½ ounces. It is stamped from cold rolled steel, case hardened, nickel plated and finely finished. Being but ⅛ inch thick, it can be inserted in very narrow places. When used as an adjustable wrench the jaws open 1¼ inches wide and ¾ inch deep. The teeth on the lower edge of the body, engaging in the teeth of the screw driver, hold the jaws rigidly, but the grip can be instantly released. The alligator jaw will turn a nut with corners

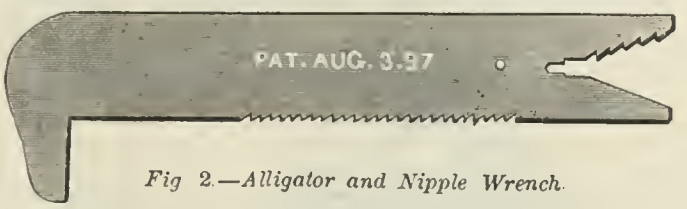


Fig 2.—Alligator and Nipple Wrench.

rounded from use. Larger sizes will be brought out in the spring for machinists, agricultural implements and general use, the proposed sizes being 6½, 8 and 10 inches, the jaws

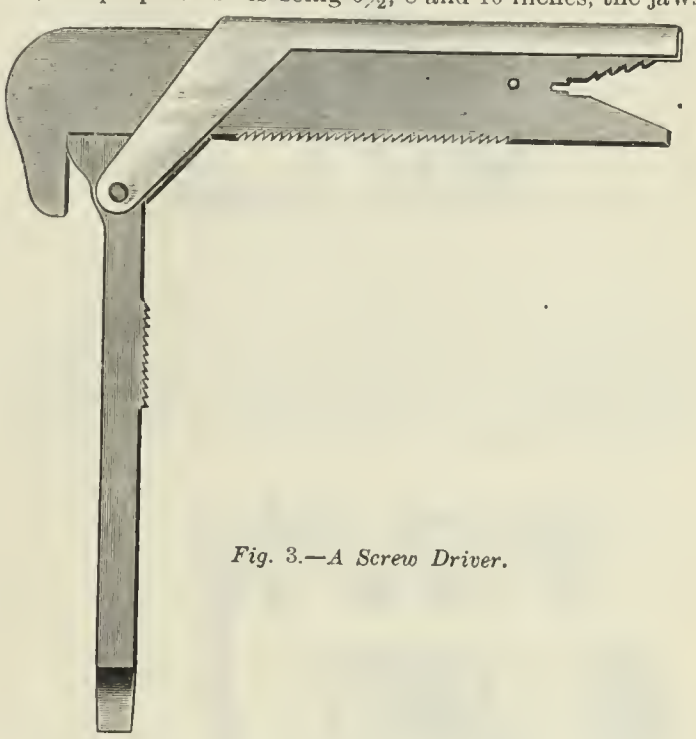


Fig. 3.—A Screw Driver.

opening 1½, 2 and 2½ inches respectively, thus giving them a good range. The wrenches are sold in the 5-inch size so as to retail at 25 cents, or with fine leather pocket at 30 cents.

MEMORANDA.

The Berger Mfg. Company, Canton, Ohio, are sending to the trade what they call their "Yellow Kid," a large card carrying on the back a striking likeness of this nondescript individual, who has something of interest to say respecting Berger's Lanterns. On the front of the card where the address is given are engravings of several styles of Lanterns, and an intimation that they are what the trade are looking for. The Berger Mfg. Company report that their Lantern has given perfect satisfaction, and that the sales are such as to convince them that it is about perfect in construction.

The Model Specialty Mfg. Company, Buffalo, N. Y., have been incorporated, with $6000 capital, to manufacture Tinware, &c. The incorporators are F. C. King, B. H. Phillips and F. H. Russ.

Etheridge & Baker, Macon, Ga., have lately completed a number of improvements in their establishment. The store room has been doubled, and modern shelving, rolling ladders, &c., installed. A line of House Furnishing Goods, Stoves, Tinware, &c., has also been added to the stock formerly carried. The business is principally retail, but some wholesale trade is done.

Sidney Shepard & Co. are the Buffalo agents for the sale of the Aluminum products of Pittsburgh Reduction Company. They are carrying a stock of the goods.

F. B. Volz is about to take possession of his new building in Janesville, Minn. The building is a two story brick, 22 feet wide and 90 feet long. It has a plate glass front and hardwood shelving embellishes the interior. Mr. Volz handles a varied line, including Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c.

The T. J. King Company, Richmond, Va., have been incorporated, with a capital stock of $10,000. The officers are T. J. King, president; W. Meade Adamson, vice-president, and C. W. Winn, secretary-treasurer. They will conduct a wholesale and retail business in Hardware, Tinware, Stoves, Sporting Goods, Implements, Seeds, &c.

The Columbia Hardware Company have opened a new hardware store at Northport, Wash. They are dealers in Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

James Porch, Chebanse, Ill, dealer in Hardware, Stoves, Agricultural Implements, &c., will shortly commence the erection of an Implement warehouse.

Universal Food Chopper.

Landers, Frary & Clark, New Britain, Conn., are manufacturing the Universal food chopper, as shown in the accompanying engravings. Fig. 1 represents the chopper

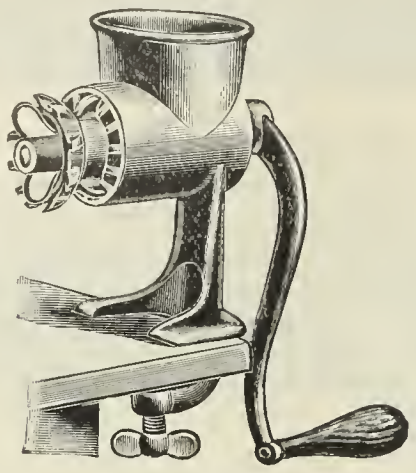


Fig. 1.—*Universal Food Chopper.*

as put upon the market. Fig. 2 illustrates the different parts disassembled. The different cutters seen in Figs. 3, 4 and 5 are put up with each chopper, and are designed for chopping a great variety of articles. The cutter in Fig. 3 is for chopping fresh and dried fruits, vegetables,

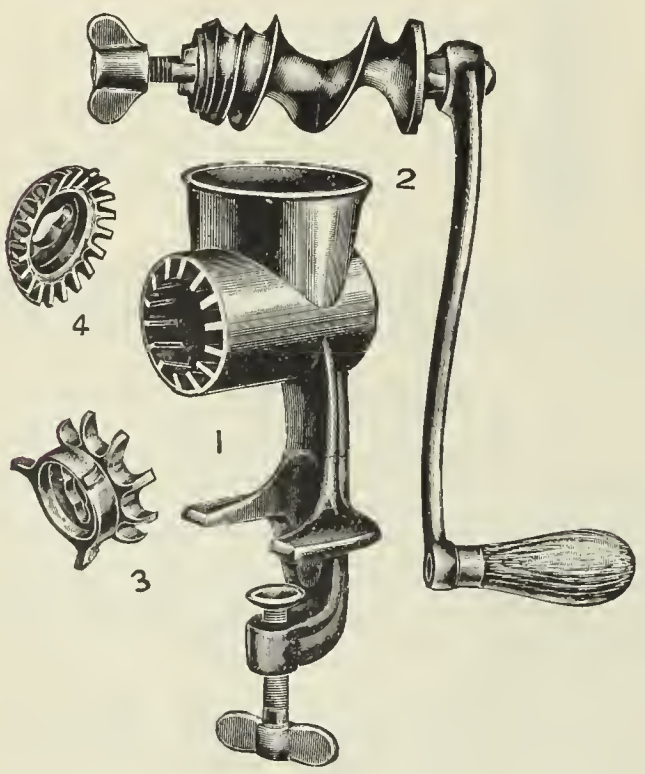


Fig. 2.—*Parts of Chopper.*

shell fish, cooked meats, nuts, &c. Fig. 4 shows the arrangement for chopping raw meat, bread and other foods. Fig. 5 shows the method of pulverizing dried bread and crackers, and treating horseradish, cocoanut, &c. All the parts are tinned, and one size, No. 1, is made for family use. The manufacturers claim for this utensil that it chops coarse, medium or fine, does not mash, is self sharpening, and that all parts are interchangeable.

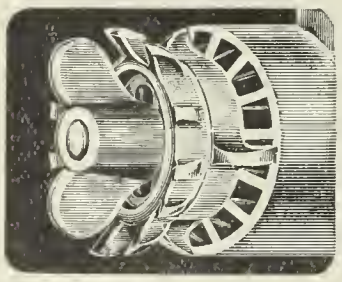


Fig. 3.—*Cutter for Chopping Vegetables, Fruit, &c.*

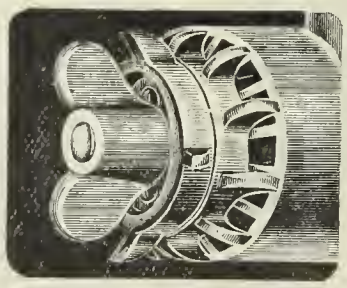


Fig 4.—*Cutter for Meat and Food in Small Pieces.*

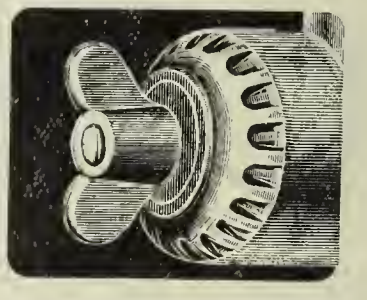
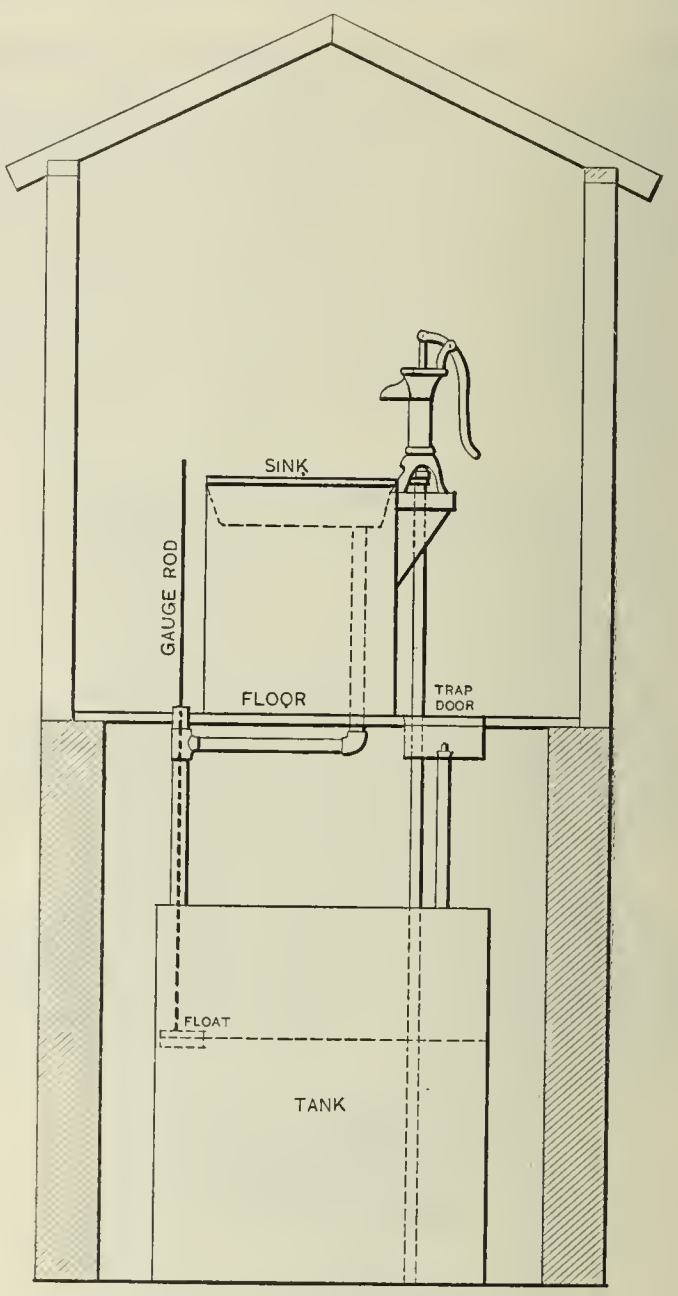


Fig. 5.—*Cutter for Pulverizing Bread, Crackers, &c.*

Gasoline Tank, Pump and Sink.

The arrangement for handling Gasoline at retail illustrated herewith is in successful use by M. Conner & Son of Plymouth, Mich. It consists of a tank, pump and sink, with the necessary pipes, inclosed in a building especially erected for them. The tank is round and is made of steel, with a capacity of five barrels. It is placed under the floor and is surrounded by a brick wall



Gasoline Tank, Pump and Sink.

6 feet high. Resting on the brick wall is the wooden structure, which is 6 x 8 feet in size, with 6-foot studding and ¼-pitch roof. The roof is of boards covered with V-crimped iron roofing. The gasoline is pumped up into the measure by means of a pitcher spout pump, with a pipe extending to the bottom of the tank. The sink has a drain pipe leading back into the tank and through a portion of this a gauge rod passes, to the lower end of which is attached a float. The gasoline is introduced into the tank by way of the trap door and pipe. This pipe has a plug at its upper end. Several insurance men who have seen this arrangement express themselves as much pleased, and state that it is the best method of handling gasoline that has come under their observation.

STOVE TRADE NOTES.

Plaster Casts and Other Methods of Molding Shell Forms.*

BY JOHN C. KNOEPPEL.

The art of constructing plaster casts for the purpose of taking off patterns in metal belongs more to the pattern maker than to the foundryman. The molder is not expected to learn this branch of the trade, as it is not universally practiced and probably not understood by many engaged in foundry work, being more in the line of pattern work.

This form of pattern making is very simple and inexpensive, yet very precise and accurate, especially so on irregular work, as patterns that require backing out, such as for deep figured, carved and ornamental designs. To properly back out a pattern so as to make it the required thickness and at the same time produce an even pattern requires great care and tedious labor. We all know that to make patterns for shell forms of any size or shape requires much time and in many cases untrue or uneven patterns are the result, when built of lumber, causing considerable trouble to the foundryman in using the same in sand on account of their being warped and out of shape.

In making patterns in plaster we first have the outer form made of wood in a block shape. Sometimes this outer part is made of plaster by the aid of suitable sweeps and having such ornamentations and figures thereon as are called for by the designer. When the pattern is completed, have a true board made with battens on and tongued on to the end to keep it from warping. Fasten the block to it with screws from the under side, varnish the same and allow it to dry. Then have a flask made for the purpose with an extra nowel part, properly fitted with pins and eyes alike and to suit pattern board.

We are now ready for the plaster cast. Put the pattern board on a bed of sand, fitting the extra nowel to it, and clamp the same. Before pouring in the plaster oil well the pattern and board, olive oil being preferable. Now mix the plaster of paris with water sufficient to give it the consistency of thin mortar, so that it will find its own way to all parts of the pattern, and of sufficient quantity to fill the nowel, allowing it a short time to settle, then strike off and put on a bottom board and secure with screws. Mixing a little parting sand with the plaster hardens it, and it will dry quicker and have less blow holes and bubbles. After a lapse of 15 or 20 minutes roll over the plaster cast and unscrew the pattern from the board, taking off the board, the pattern proper still remaining in the plaster. Rap carefully and draw it out of the plaster. You now have an impression the reverse of your pattern. While the plaster is drying take the block pattern and put it back to its original position, being careful to clean it well before using it for molding from it. At this point you have a concave and convex form of pattern. The plaster cast should be allowed to dry for at least 15 hours, but could be dried in less time with moderate heat.

We are now ready for filling up the thickness in the plaster cast. Have a true board made, with strips of the required thickness fastened to it at each end. This board should be about the size of a kneading board, such as is used in our homes. Mix up a composition of whiting and melted beeswax to the cousistency of stiff dough and with a rolling pin roll out suitable sheets, cutting them into different sizes to suit the work, laying and pressing them carefully in and against the surface part of the cast, using suitable tools, the hands and fingers comiug into play frequently. Secure the filling with tacks.

This filling or thickness composition should be put only where the pattern line shows; all of it should be well varnished, and when sufficiently dry proceed to mold.

Take the bottom board and pattern, place the nowel for the purpose upon it, being careful that there is no shift, and fit into the pins on board tight; ram this up with sand in the usual way, treating the mold as you would in every case, clamping the saue as in the case of pattern makiug or molding. Roll over on the bed and unscrew the pattern from board, taking it off; draw out the pattern proper and finish in the usual way; then proceed to the cope part. Take the plaster cast and place the cope on it, using the saue precautions as with the pattern. Provide suitable gates for pouring and ram this part up with sand also. Roll over, being very careful not to disturb the mold in drawing the cast off the cope. Finish as usual.

We now have both nowel and cope part. Close these two parts together, marking the gating points with flour; take off the cope again, cut the gates, reclose flush and clamp up. When you are ready for the metal, before closing for the last time, be sure that the parting line meets. A little flour will help to fill up if a little slack, thus producing an economical as well as a very true and reliable mold. Sometimes a right and a left form are necessary, such as for heads, birds, animals and statuary, to produce a full form. In that case both sides are made in the manner described above.

While at work some years ago in one of the Western foundries a large number of these patterns were broken and patched so much that they made heavy as well as unsightly castings. The original could not be had, and of course could not be duplicated. I then suggested plaster casts and the work was given me. Using the regular patterns to work from, the first cast was reduced about 10 pounds over the old one. The result being satisfactory, I was given more to make up, due allowance being made for shrinkage.

A large variety of subjects can be made in plaster, and when once acquainted with this branch many lines can be pursued for plumbers' work, tees, elbows, branch pipes, hoppers, &c. These casts can be preserved for future use, or a number of master patterns may be taken off and stored.

Another good way to take off block patterns is by stripping. While it is not as accurate and precise as the plaster cast, yet it will answer in many cases. The plan is similar to that mentioned, but instead of plaster we work the block directly with sand. The block is made and secured to a true board, as in the case of plaster casts. A cope is fitted to it, and rammed very hard with common sand and rolled over. The board is taken off and the pattern drawn out. Suitable wooden strips are cut to conform to the work and of the required thickness. Now have sufficient paper on hand, cutting the same into suitable strips, and lay it on the surface of the mold and nail the paper to the sand until the required thickness is obtained. Then commence laying on the wooden strips, these being cut large or small as required. After all is filled up even with the joint, fill in with fine sand. This might be done while laying in the wooden strips to keep them from falling out of place, being careful not to disturb any part of the mold. Then place the nowel upon the cope and ram up in the usual manner, roll over carefully and take off cope. The cope is what we term a false coping, and is shaken out. After cleaning off the pattern prepare the cope in the usual way. Put it on the pattern board with block fastened thereon, clamping and setting the gate pins and ramming up with sand. This needs to be treated differently from the first case, not ramming too hard, and in the regular way, as in the course of molding. Roll over, take off the board and draw out the pattern. Now finish both parts, nowel and cope. When completed close cope on the nowel, put a little flour on the joint with a bag, lift off and see if joints touch and meet and join securely; see if you have eveu thickness; then close again and the mold is ready for pouring.

Almost any form of work can be made in this manner, of a smooth character, such as kettles, pipes, drum tanks, bathtubs, &c.

Still another simple way is to make a core the desired shape with a sweep, drying it, and then with the thickness strips lay on the core and ram up.

A few years ago I made a steam receiver with reducing end and flanges, 30 inches in diameter, 10 feet long, reducing end being about 20 inches, weighing about 5000 pounds. The party wanted only one casting, and it would not pay to go to the expense of making a pattern. I proceeded as follows: Sweeps were made to conform to the shape at each end and at the center. A skeleton frame was also made and was laid on core plates made in halves and dried, with proper core irons, having suitable holes drilled and threaded to handle them in lifting. I placed one half on mold board, placing the flanges at each end, and having the thickness strips ready to lay on the core and rammed up in the usual way with sand; rolled over and made joint. Put on the other half core, and stripped it as in the nowel, being careful that they corresponded with each other. Put on the cope and set the gate pins and rammed up. After lifting off we took out

*Paper read at the regular monthly meeting of the Western Foundrymen's Association, Chicago, November 17.

the cores and returned them to oven for redrying, finished the mold, setting chaplets and resetting cores, said cores providing their own prints. This was cast in green sand and turned out very good.

DISCUSSION.

C. A Sercomb: The writer does not refer to the expansion or contraction of the plaster after forming the mold. Information as to the expansion or contraction would be valuable.

A. Baer: There would be a shrinkage if anything. If you had to nail it on the board before pouring it would shrink away from the frame and drop.

J. Ott: I have never had any experience in making ornamental patterns, but I have made a great many casts of plaster of paris. The only time that I ever found plaster of paris expanded was when we put the wood into sand. I would suggest the use of emery dust instead of sand. It causes the plaster cast to harden so that you can hardly cut it with a chisel or knife. I have made light plaster of paris patterns, but I have never paid much attention to the expansion or contraction.

W. Ferguson: Although I am not very familiar with reversing, or making patterns as described, the principle is applied in all foundries—in all classes of molding, green sand molding, dry sand molding and loam molding—in getting the one side of the pattern. Suppose you are making a stove door, you make the bottom part of the mold and get the drop from it. The same thing is applied in making a kettle exactly. Sweep up the outside and inside the full size and then take off the thickness. It is the same principle. So it is true in making pipe of all kinds. That is another application of the same principle. I think you will find it in regular practice anywhere.

W. L. Thompson: I can see where the putting on of this strip can be of considerable advantage in ornamental work or in the making of core boxes. But in making a pipe or receiver the ordinary way of sweeping up from a spindle with bearings at each end would be a cheaper way of making the casting. This material is expensive. I do not see there is any advantage gained by using any material for putting on the thickness, for where the outside diameter is swept up first and the cope rimmed on that and then the thickness put on the sweep and the sweep put in the mold after the cope has been taken out, and the thickness swept up that way, it is plainer and cheaper and we can apply it to everything but ornamental work.

A. Baer: As I understand it, this method is used principally on ornamental work. In pipe or kettle work you can sweep readily in green sand, and it is much easier than plaster of paris by having a double sweep.

The Treatment of Gasoline Fires.

Several firemen were severely burned at a recent gasoline fire in Philadelphia on account of not being familiar with the proper method of handling such conflagrations. As a result A. W. Daniel of the Atlantic Refining Company arranged with Director Riter to give the department a series of object lessons. A representative of the *Ledger* who saw one of the demonstrations gives the following account, which he says to the majority of those present was a revelation:

It was with a great deal of incredulity that they heard Mr. Daniel's statement that gasoline is not explosive. Not a few of them thought they knew better, and the scare heads in the newspapers for years had told of "another gasoline explosion," until there seemed to be no doubt of its dangerous character. When he said that gasoline was safer than gas, curiosity to learn something about the subject had been aroused to a high pitch.

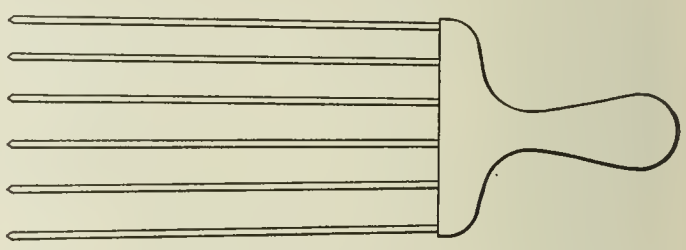
The speaker described the usual course of events in a gasoline accident, such as the policemen and firemen are familiar with. The maid of the kitchen desires to fill the tank of her gasoline stove. She brings out the can, opens the reservoir, pours in the fluid, but neglects to turn out her fire. The can, the reservoir and the stream of fluid are all giving off a vapor, which, mixed with the air, falls down to the burner of the stove, ignites, and the flames extend to the spout of the can and the opening in the reservoir. In the excitement caused by the explosion she drops the can, the gasoline flows over the floor or gets spilled upon her garments, which also take fire, and she runs shrieking from the scene, breathing in the flames and destroying her lungs. What else takes place? The gasoline continues to burn. There are no more explosions, but it calmly burns like a tallow dip. The reservoir has a small flame at its inlet, and the can, if standing on the floor, will have a flame at the spout. Had the maid held the can, it would not have had its contents poured upon the floor, nor upon her dress, and it would not have exploded.

The experiments to show these facts were startling. Mr. Daniel would allow the gas from the reservoir and the can to take fire, and would then deliberately pour the gasoline into the reservoir and let the two vessels burn indefinitely. He handled it as carelessly as if it had been water, and poured a quantity of it upon a plain wooden table and set it on fire, where it burned itself out without setting the table on fire. He put the fire out of the burning cans by stopping up the nozzles, either by the stopper or by anything that would close them. All that was necessary was to stop the flow of the gas, or to exclude the air, and the flame would cease. In most cases the best thing to do with a gasoline fire is to let it burn itself out. If there are no light draperies in the kitchen there will be nothing to catch fire, and when the spilled fluid is consumed it will be easy to extinguish the few things which may have caught fire before it makes much progress. Or the flame may be covered to exclude the air, which will at once put it out.

An Improved Small Venting Tool.

BY THOMAS F. KENNEDY.

I have had in mind for some time an idea of a small venting tool that will save a good deal of the time and labor required to vent a mold and that will enable one to place every hole where it will be most effective. The stove molder making a light plate scores his drag from side to side, or end to end, or may be both ways, at intervals of 3 to 8 inches; then with his one wire he goes back and forth along each score two, three or more times, according to the closeness of the sand or the liability of the piece to scar or blow. On a large plate in close sand this is a very tedious job, and molders often seek to gain time by slighting it, generally to their ultimate loss. It is necessary in nearly all sand, even on small castings, to



An Improved Small Venting Tool.

vent freely around flat gates; slighting these is sure to cause loss. Then in some sand the cope of every mold must be vented, and there are certain pieces the copes of which must be vented in any kind of sand. To make much of an impression on a large cope with a single wire takes so much time that it is a standing temptation to the piece worker to slight it. My idea, and so far as I can learn it is entirely original with me, is to apply the gang principle to small venting tools.

There is hardly any limit to the number of wires that could be used or the variations that could be made in their arrangement, but in its simplest form there would be a single row of from 4 to 12 wires. It would effect a great saving of time and labor for the molder making castings which from their nature or the nature of the sand required venting. The number of wires and distance apart will depend on the size and nature of the work and on the closeness of the sand. A molder working on a straight job, say of oven plates for stoves, might have two or more specially adapted to different parts of the work. He could have one that would reach from side to side of his drag and wide enough so that five or six motions of the hand would cover the whole drag. The wires could be cast into a plate of sufficient thickness, which for convenience in handling could have a handle attached the same as a plasterer's finishing trowel.

The wires could be arranged in rows or irregularly at any distance apart. For his cope and flat gates he should have one just large enough to cover one side of his flat gate, with one or two rows of wires in it. The simplest form of a gang venting tool is illustrated herewith, the handle being of cast iron with the wires cast in. The larger tool would be impracticable on many jobs, but I cannot conceive of a job where at least two wires could not be used to advantage and with considerable saving of time.

All Sorts of Garlands.

An envelope of a pronounced reddish hue has been received from the Michigan Stove Company, on the exterior of which are printed the words "Decided Bargains." On opening it the envelope was found to contain a 16-page catalogue of special bargains in stoves and ranges now being offered to the trade by that company. They comprise the Champion-Garland six-hole range, for hard coal or wood; the Challenge-Garland six-hole range, for soft coal or wood; the Family-Garland four-hole range, for soft coal or wood; the Domestic-Garland four-hole range, for hard coal or wood; the Home-Garland four and six hole range, for wood only; the Family-Garland soft coal or wood cook, the Domestic-Garland hard coal or wood cook, the Home-Garland wood cook, the Ideal-Garland direct draft heater, for coal and wood; the Alpine-Garland heater, for soft coal; the Peerless-Garland heater, for hard coal or coke; the Laurel-Garland direct draft heater, for wood; the Oakdale Garland direct draft heater, for coal or wood; the Syphon Oak-Garland, for coal; the Horizontal Oak-Garland heater, for wood; the Oak-Pennant, for coal or wood, and the Parlor Queen parlor cook stove. These goods for the most part consist of patterns that have just been replaced by new goods for the current season, and are therefore not old, undesirable and unsalable.

ODD PLATES.

Part Three of the annual report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania, for which we are indebted to James M. Clark, Chief of the Bureau of Industrial Statistics, gives the statistics for the year 1896. One section relates to the manufacture of Stoves, Heaters, Ranges, &c., and presents figures of capital invested, production, value and cost of materials of 39 different works. The total capital invested in plant and working capital of these as given in the report amounts to $5,440,812 and the production is valued at $4,206,864, this product having been made from base material which cost $841,340. The average days of operation of these different Stove foundries amounted to 220, while the average number of wage earners was 3584, the wages they received amounting to $1,684,765, the average daily wages being $2.13. In analyzing the elements of cost in the product, the averages given in the report are 20 per cent. due to basic material, while 40 per cent. was for wages.

The Whitcomb Stove Company, Springfield, Mass., have recently closed a number of heating contracts, among which is a house for H. Sheldon, at Merrick; for J. Roberts, at Brightwood; for M. Taylor, at Chicopee, and also one in Indian Orchard, block of flats for J. Craig, besides a number of contracts in Connecticut and in Springfield. In each instance the heating system includes one of the Royal Heaters made by Hart & Crouse, Utica, N. Y.

The Charter Oak Stove & Range Company, St. Louis, in their page advertisement which appears in another part of this issue call the attention of the trade to their line of Charter Oak Toy Stoves. These Stoves are made in every detail similar to full sized Stoves, and the company state they will bake, roast and cook to perfection. The company urge the trade not to delay ordering these Stoves, as the holiday season will soon be here.

A letter from E. E. Horton, one of the representatives of the Thatcher Furnace Company of New York, informs us that the contract for heating and ventilating the new Richmond Avenue M. E. Church of Buffalo has been secured by Edward Kener, Jr., of that city. The Thatcher Combination Hot Air and Hot Water Heaters will be used for the work in connection with electric fans for ventilating purposes. There will be three No. 256 and one No. 248 Thatcher Tubular Combination Hot Air and Hot Water Heaters used in the heating system.

A contributor to *The Metal Worker* who has seen the article in reference to a hustling salesman gives the following account of another hustling salesman: "In going from New York home on my train recently I was overtaken by a Stove dealer, who remarked that the beautiful weather this fall had made the sales of Stoves beautifully small, and it was now about November 10 or 11 and practically no cold weather. I assured him that he need not feel disappointed, that the cold spell would be due in the vicinity of New York on the 18th. He inquired as to the cause of my positiveness, and I referred him to the DeVoe predictions, according to which on the 18th the first cold weather flag of the season would be shown and consequently the Stove business would take a boom about that period. The subject of conversation then changed, but on the Stove dealer reaching his residence he requested his wife to remind him that there was to be a cold spell on the 18th, that he had been informed that this was DeVoe's prediction and he wanted to take advantage of it. Consequently he arranged to set out on Wednesday, the 17th, to take advantage of this prediction, when to his satisfaction he found that both himself and the cold weather were on hand. As a result of this hustling and taking advantage of the signs of the times he brought in with him orders for 50 Stoves."

The Michigan Stove Company have received a letter from Wm. L. Dudley, director of affairs of the Tennessee Centennial Exposition, announcing that a silver medal, the highest award for any stove exhibit, had been voted their exhibit of Garland Stoves and Ranges. Accompanying this letter was also a beautiful engrossed diploma of award, which is very highly prized by its recipients. In addition, the officers of the company unhesitatingly state that the benefits derived were more than satisfactory to them.

The Kernan Furnace Company, Utica, N. Y., makers of the well-known line of Kernan Hot Air Furnaces, were awarded a silver medal for excellency at the Tennessee Centennial Exposition, held at Nashville.

The first calendar for 1898 reaching us this year comes from Hart & Crouse, Utica, N. Y., with branch offices in New York City, Columbus, Chicago and St. Louis. The advertisement carried is very brief, but is sufficient for all purposes, in view of the fact that the Royal Heaters are well known throughout the United States. If they were some insignificant and obscure creation it would be necessary, perhaps, to illustrate and describe them on the calendar to let the people know what they were, but there are no readers of *The Metal Worker*, at any rate, who have not heard of the Royal Heaters, and the bare announcement is sufficient for the purpose. In consequence of this brief statement there is ample room for decoration, and this consists of a picture, given in colors, representing a painting by Hartson of an old fashioned wind mill in Holland. The calendar at the bottom is in the shape of monthly sheets.

The Boston retail merchants have taken an excellent means of building up their fall trade and concentrating into the week from November 29 to December 4 a great deal of business with out-of-town shoppers. With a view to calling in customers from outside of Boston they have secured for travelers in New England special excursion rates to Boston, and undoubtedly this excellent movement will bring great crowds of shoppers into the old town. While it is intended particularly for the retail merchants, the occasion has not been neglected by the Magee Furnace Company, whose home office is in Boston, at 32 38 Union street. In their announcement this week they invite all, whether old or new friends, to take advantage of the low excursion rates and visit their salesrooms and inspect the Magee Ranges and Heaters. Those handling the Magee goods will do well to accept this invitation, whether they intend purchasing or not, for they will have a cordial welcome, and will find it more satisfactory to inspect the Ranges and Heaters themselves than to judge of their merits from catalogue illustrations.

We regret to announce the death of Jonas Snyder, treasurer of Thomas, Roberts, Stevenson Company, Stove founders, Philadelphia, which occurred November 23. The funeral services are to be held to-day, Saturday, at his late residence, 1519 North Seventeenth street.

The new plant of the Dennison Rolling Mill Company, at Dennison, Ohio, is now in operation. The construction of this plant occupied about four months. It is a two-mill plant, consisting of two pairs of 40-inch hot rolls, one pair of roughing rolls and one pair of cold rolls, with a capacity of 5000 tons of finished material annually. The building is constructed of iron throughout. The main building is 105 x 140 feet, with sheds and electric building. The electric plant consists of one 25-light 2000 candle-power arc and 50-light incandescent generators. The concern use coal for heating furnaces and all other appliances, controlling and operating their own mines, which are situated within a short distance of their plant. Their boilers are four in number, 72 inches by 18 feet, fed automatically by Murphy stokers. The concern advise us that they have orders sufficient to take their output for next four months, with prospects of a large trade right along. The concern are manufacturers of fine sheet steel, common cold rolled, pickled and cold rolled, pickled finished and stamping steel. The officers are W. W. Irwin, president and general manager; E. Langenbaugh, vice-president; C. A. Smith, secretary, and Jacob Shumaker, treasurer.

Robert N. McElroy has severed his connection with Park Brother & Co., Limited, to accept the financial management of the plant of Brownell & Co., at Dayton, Ohio.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Wholesale prices have unerdgone a slight advance and the market has ruled very firm. No change was made in jobbers' quotations for small lots from store, which rule at 14¾c. for Straights Pig. There has been fully the average seasonable demand for consumption, but jobbers purchased moderately and purely speculative interest remains inanimate. The arrivals since the beginning of the month amount to about 1500 tons, which quantity is below the estimated consumption.

Copper —The general condition of the market remains virtually the same as it was at the date of last week's report. Exporters have made no unusual purchases nor displayed remarkably lively interest and operations of home consumers continue to be extremely conservative. Prices have undergone little or no variation. Small lots from stock remain at about 12c. to 12¼c. per lb. for Lake Ingot and 11c. to 11¼c. for Ansonia Grade Casting Copper.

Sheet Copper.—Orders have been of very moderate proportions. Jobbers generally quote Sheet Copper in retail lots on the basis of 15c. per lb., but this price is shaded in some quarters.

Pig Lead.—A turn for the better has taken place in the market. Offerings have been smaller and less urgent, while the demand has shown improvement, not extending to anywise remarkably large lots. So far as the jobbing trade is concerned, sales are still of very ordinary type, with an almost total absence of active interest among the larger consumers. American Pig in small parcels from store is quoted at 4⅛c. to 4¼c. per lb.

St. Louis advices are as follows: The market is in an interesting condition. The speculative interest in the market is supposed to be quite heavy, and the events of the past few days tend to verify this supposition. Efforts have been made to secure large lots, but producers are unwilling to sell their product beyond the present year. The situation is materially improved, and those in position to know are anticipating an early advance.

Spelter.—The market has continued weak, under the influence of present and prospective large production and absence of expansion of the outlet. Ordinary Western brands are selling in a retail way at 4.65c. to 4.75c. per lb.

St. Louis advices indicate no change in this metal. Consumption is moderately heavy and the outlook for Spelter in that market is fairly satisfactory.

Antimony.—About the usual jobbing business is going on and prices remain quite steady at 7¼c. to 7½c. for Japanese, 7¾c. for Hallett's and 8½c. for Cookson's.

Nickel.—The market remains steady at about 35c. to 36c. for small parcels.

Tin Plate.—While American makers are generally well supplied with orders for delivery in the balance of this year, and some as far ahead as the second quarter of 1898, offerings of futures are more free and prices remain somewhat unsettled. Spot stocks, however, are very firm and deliveries are still delayed by the trouble the mills have experienced in securing Steel. This stringency is gradually abating and the conditions introduced by it into the market will probably have passed away by the end of the year. Meanwhile available stocks are very light, especially of Coke Tins. The demand is so extremely slack, however, that this scarcity makes little impression on the market. The trade at the present time is desperately dull, with no prospect of an improvement before the turn of the year. Retail orders were smaller than for a long time past. Jobbers' quotations on moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do. 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3 40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are selling slowly and are nominally unchanged in price.

A special London cable dispatch of November 24, 1897, reports on the British Tin Plate market as follows: Tin Plate has been slow and the demand is quiet, with interest chiefly in specials. Prices are barely steady at about s. 4½d. to 9s. 6d. for ordinary Bessemers.

Sheet Iron.—The demand has eased off to some extent, and the mills are now entering orders for little beyond small lots for early shipment. In the East thin Sheets are in the strongest demand, the heavier gauges of Black Iron being inactive. Galvanized Sheets are dull. Prices are unchanged. Jobbers in this section quote small quantities from stock at 2.35c. to 2.40c. per lb. for No. 27 Common Black Iron and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: A better inquiry has recently sprung up for Black Sheets covering 14 to 28 gauge. The greater part of the new business appears to be coming from manufacturers of Stamped Ware. The demand for Galvanized Sheets, which has been steadily excellent, continues as good as ever. Jobbers' stocks are still being drawn upon for Black Sheets, although the season is so far advanced. Small lots from stock are held at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—Market quiet, with no new features in either domestic or export business. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3.05c.
Zinc	per lb. 2½c.
Zinc Dross in slabs	per lb. 2.60c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10.50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5.25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	5.00

THE IRON MARKET.

Developments have been very meager during the past week. It has become a waiting game in which many are arrayed on the one side who themselves believe, with Benner, that 1898 is to be a very good year. The majority do not expect any decided movement until March or April, and are quite willing to put pressure upon the raw materials in the meantime. They have the usual winter dullness to help them.

A weakening tendency has developed in many lines, and prices are a shade lower. This is true of Bessemer Pig, Steel Billets and Wire Rods. In some branches of the Finished Iron trade there is some activity. Thus Chicago notes quite a tonnage of Bars. In a few weeks the days of making repairs and renewals will be at hand, bringing a natural if only temporary restriction of the output.

Pig Iron.—While deliveries continue good new business is light. There are some inquiries in the New York market for next year's delivery, but buyers and sellers are yet apart. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $11 to $11.25; No. 2, $10.50 to $10.75; No. 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

In the Philadelphia market buyers of Pig Iron are feeling the market for quotations on deliveries for the first quarter and some for the first half of the coming year. Sellers are rather more disposed to encourage business, but they cannot see their way to making concessions; neither are they willing to go very far ahead at to-day's ruling prices. There is, therefore, a stand off on both sides, which will probably not be broken until natural conditions solve the problem. The chances do not appear to be favorable for immediate activity; neither is it likely that prices will show any appreciable change from the figures quoted during the past several weeks, which have been within the following range for seaboard deliveries, subject to the usual freight differences at points within 100 miles south and west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75 to $11.

Moderate sales are reported in Chicago of local Coke Iron. Inquiries for next year are being received, but

buyers are usually in no hurry to close, an occasional order being entered from some consumer who is of the opinion that he will lose nothing by placing a contract now. Prices are firm, sales being made at our quotations. Southern sales agents also report firm prices, although transactions are quite light and inquiries are not numerous. Quite a little demand has sprung up recently for Lake Superior Charcoal, but only for small lots so far as known. We quote for cash as follows :

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

The Pittsburgh Pig Iron market is extremely quiet and prices are a shade lower. There is considerable pressure on the part of furnaces to sell Bessemer Iron for December, but higher prices are asked for first quarter. Foundry Irons are very dull in this market. We quote, f.o.b. Pittsburgh : No. 1 Foundry, $10.65 to $10.75 ; No. 2 Foundry, $10.15 to $10.25 ; Bessemer, $10.15.

There is no change in the Pig Iron situation in the Cincinnati district. There has been a very fair tonnage booked during the past week, made up mainly, however, of the daily driblets which no one in commenting thinks worthy of special consideration. Inquiry within the past few days, however, has brightened somewhat. There is hardly enough of this inquiry, however, to indicate much of a buying movement in the last weeks of 1897. Prices are nominally unchanged and the general situation has many points which ought to work out a strong market when the buyers appear. The general situation loses nothing from week to week in healthy tone and vast quantities of Iron are still being melted. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

In St. Louis the market continues to show remarkable strength in view of the dullness at present prevailing, but the explanation is readily found in the condition of stocks both in consumers' and producers' hands, which show a steady decline. The consumption of Pig Iron is heavier than the most sanguine anticipated, and as there is no immediate prospect of any falling off in this direction the prices at present ruling are thought quite likely to be maintained, even if no advances are recorded. Business is expected to be unusually heavy after the turn of the year, as many concerns are allowing their stocks to run down so as to make their annual inventories. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.50 to $11.00
Southern, No. 2 Foundry	10.25 to 10.50
Southern, No. 3 Foundry	10.00 to 10.25
No. 1 Soft	10.25 to 10.50
No. 2 Soft	10.00 to 10.25

TRADE NOTES.

We are indebted to the Pope Mfg. Company, Hartford, Conn., for a copy of their handy Columbia desk calendar for 1898, being the thirteenth annual edition of that useful publication. It is in the form of a memorandum block, a page being provided for each day of the year. Plenty of space is allowed for memoranda, and at the top of each page is given a quotation, a verse, a squib, or a testimonial from some admirer and user of the famous Columbia wheel. The calendar stand is so arranged that it may either stand on the desk or hang upon the wall.

The Norwich Nickel & Brass Company, Norwich, Conn., have been incorporated, with a capital of $15,000, by W. A. Aiken, E. C. Aiken and Ed. A. Tracy.

The Bignall & Keeler Mfg. Company, Edwardsville, Ill., report a heavy demand for their Peerless and Duplex Pipe Threading and Cutting Machines. Among the recent sales they report the following: Armour & Co., South Omaha, Neb., and National Tube Works Company, Chicago, three machines each; Nelson-Morris & Co., St. Joseph, Mo., and United States Government for new dredge boats for Mississippi River Commission, two each, and one each to the following: G. T. Reynolds, Cairo, Ill.; Ogden Gas Company, Chicago, Ill.; Swift & Co., St. Joseph, Mo.; Wabash Railroad Company, Decatur, Ill., and W. S. Laycock, Sheffield, England.

CHICAGO REPORT.

Scrap.—Dealers are again beginning to accumulate stock, in anticipation of an improvement in the demand. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$6.75	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9 c.
Red Brass	....	7½c.
Yellow Brass	....	6½c.
Light Brass	....	4 c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—Sales are light and prices are being cut. The card on carload lots of 12 tons minimum is now as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

A strong company of Eastern capitalists, including ex-Governor Flower of New York State and J. W. Hinckley, Anthony N. Brady and Perry Belmont of New York City, have purchased the entire property of the Walker Company, manufacturers of electrical apparatus, Cleveland, Ohio. The Walker Company have extensive factories and foundries in Cleveland, covering many acres.

A special dispatch from Dallas, Texas, reports that 400 square miles of prairie in Lubbock, Hale and Crosby counties, in that State, were burned over by a severe prairie fire last week. Large numbers of cattle and sheep were destroyed and many farmers lost their winter feed stock.

The Inland Iron & Forge Company have been incorporated, with a capital stock of $225,000, to operate the plant of the defunct East Chicago Iron & Steel Company at East Chicago, Ind. The incorporators are P. D. Block, G. H. Jones and Frank Wells. The stockholders of the Inland Iron & Forge Company are practically the same as the parties who now own and operate the Inland Steel Company at Chicago Heights. The business of the latter firm has increased to such an extent that they are unable to accept all the orders offered them, and so arranged to secure the East Chicago plant. It cost originally $300,000.

The Chapin Mining Company, the Pewabic Company, the Antoine Ore Company, the Aragon Ore Company and the Pennsylvania Iron Mining Company at Ishpeming, Mich., have announced a 10 per cent. increase in wages, to take effect on January 1. The increase affects more than 2000 men. There is a shortage of men at all of the mines. The mines will be worked steadily throughout the winter.

THE HARDWARE TRADE.

Trade is showing indications of the near approach of the holiday season and the closing of the year. Merchants are disinclined to buy goods which will be carried over and thus find a place in the annual inventory; travelers are beginning to come home, though the great majority of them are assiduously cultivating their trade and obtaining such orders as they can; jobbers are pushing energetically to get rid of any goods of which they have a larger supply than they want, and are accordingly cutting prices a little more freely; manufacturers are refraining from the solicitation of orders for this year's business, but are, in season goods especially, negotiating for next year's requirements; and the approach of the holidays and the advent of winter weather are stimulating business in seasonable goods and fancy articles for the Christmas trade. Under these conditions the volume of business is diminishing, but trade still continues in fair volume, all things considered. The tone of the market is not quite so strong as it has been, but the quotable changes are few. The most noticeable weakness is in Nails, which have still further receded in price. The manufacturers allude to the lower quotations as caused in good part by the freedom with which the purchasers of Nails before the recent advances are marketing what they have in stock at concessions from the regular quotations. Export business in Hardware and related commodities shows a gradual and on the whole important increase, and the manufacturers of this country are recognizing more and more the desirability of cultivating and holding this class of trade. Whatever may be the disadvantages which result from the low prices which prevail, and will likely prevail, they unquestionably place the country in an excellent position to make goods for foreign markets. Reports indicate a gradual improvement in general trade throughout the country as compared with recent years at this season, and hopeful anticipations are expressed with reference to business.

Advices from Chicago.—Shelf Hardware jobbers report a much better trade. The weather all over the Northwest is now decidedly wintry and the country is rapidly freezing up. A strong demand is experienced for seasonable goods. The early orders placed for these goods were large, but the demand now coming in shows that stocks have been run off and a further supply is needed. This improved buying movement in seasonable goods leads to a heavier demand for the general line. Mails on Monday were unusually heavy, adding considerably to orders which had to be carried over from last week by most houses. The shipping departments are now being rushed and additions are being made to the packing force. An improvement in business this year, owing to the greater fall trade, is now being shown as compared with last year. The gain up to the present time is estimated to have been at least 25 per cent. Some houses will probably be able to show a little larger gain. The cut in freight rates on Colorado lines is still effective and is inducing a large volume of business in that direction. The merchants of Kansas, Nebraska and Colorado, as well as States beyond the Rocky Mountains, are laying in large stocks of goods while they can have them delivered at such extremely low rates as now prevail. Manufacturers' agents report a very good volume of business. A combination has been effected among Rivet manufacturers and the discount to jobbers has been advanced to 80 per cent. Heavy Hardware jobbers report a continued good trade The demand for Iron and Steel is strong and the movement of Wagon Stock is steadily good. Collections are excellent.

Advices from St. Louis.—The Hardware trade continues in the satisfactory condition last noted. The weather has finally turned seasonable and the demand for cold weather goods is remarkably active. The demand for Shelf Goods continues in satisfactory volume and prices are being well maintained. Holiday goods are finding ready sale, as are also the different lines of Heavy Hardware. Ammunition is also among the active articles. Nearly all the jobbing houses will show an excellent gain in comparison with their business for 1896. Collections are satisfactory.

NOTES ON PRICES.

Wire Nails.—The principal change to be noted in the Wire Nail market since our last issue is a further falling off in the demand and the prevalence of slightly lower prices. Most of the jobbing houses who have stocks of Nails are preferring to dispose of them at a narrow margin of profit rather than carry them over into next year. New York quotations are $1.65 for small lots from store. The negotiations with a view to the control and consolidation of Wire interests are still in progress, and the project, while not by any means consummated, is assuming more definite shape.

Advices from Chicago.—Heavy shipments are still being made to the West by leading Nail manufacturers. The continuance of the low freight rates is decidedly stimulating this movement. The termination of the yellow fever scarce in Texas is also bringing heavy orders from that section, with which a light trade had been done during the fall months. While the market is easier at present the manufacturers look forward to better spring prices. Jobbers report an improvement in their sales, with prices quoted in a regular way at $1.50, with concessions to the best trade.

Advices from St. Louis.—The market has failed so far to show any improvement, and in the absence of any heavy demand no advances are anticipated. Jobbers ask $1.55 to $1.60 for small lots from store.

Cut Nails.—There has been little change in the Cut Nail market since our last report. In some cases, principally in the West, slightly lower prices are obtainable. The mills report a demand which is apparently somewhat stimulated by the low prices ruling, and they also refer to the recovery by Cut Nails of trade which has been going for some time to Wire Nails. New York quotations for small lots from store are $1.35 to $1.40.

Advices from Chicago.—The demand for Cut Nails is light, with prices unchanged at $1.45 for small lots from stock.

Advices from St. Louis.—The Cut Nail market continues in the unsettled condition last noted. The demand is light and prices continue weak. Jobbers ask $1.45 to $1.50 for small lots from store.

Barb Wire.—Both manufacturers and dealers report but little doing in Barb Wire. Prices are pretty well maintained.

Advices from Chicago.—Manufacturers report a continued good trade with the West and Southwest. The demand in this immediate vicinity, however, is light, and is not expected to improve until some time in December, when the usual buying movement may be expected for spring delivery. Jobbers quote $1.55 to $1.60 for Painted and $1.85 to $1.90 for Galvanized in small lots from stock.

Advices from St. Louis.—The market is dull and prices are inclined to weakness. Jobbers are asking $1.60 for Painted and $1.90 for Galvanized for small lots from stock.

Smooth Wire.—There is no change in the price of Smooth Wire, but the demand is sluggish. As usual at this season the trade are refraining from purchasing beyond their immediate wants.

Glass.—Reports of recent meetings held by representatives of the associated manufacturers and workmen indicate that a settlement of the wage question is nearer than at any time during the past three months. The discount on imported Glass has been advanced from 60 and 20 to 60 and 10 per cent. This advance was made necessary by the recent advances of American Glass to equalize the prices of foreign and domestic products, the New York jobbers' price for American Glass now being 60 per cent. discount. Chicago jobbers advanced the price of American Window Glass last week to 60 per cent. off, as had been predicted. This advance is expected to be followed shortly by another rise of 5 per cent. The local jobbers are of the opinion that their stock rooms will be completely cleaned out by January 1 unless the wage question is speedily settled and the factories started up so as to produce new Glass. It is stated that with the recent advance in prices the list is now 35 per cent. higher than four months ago.

Linseed Oil.—A good trade has been done in city brands, and there is at present a fairly active demand. Retail prices are higher and firm at 39 to 41 cents.

White Lead.—There has been a good jobbing distribution and some contracting for next year's delivery. The spot business is at old prices; next year's contracts will be decided upon later. Generally the market remains firm, as it has been for several weeks.

Spirits Turpentine.—Fairly large sales have been made in the South, and in this market prices are firm.

The regular scientific meeting of the Engineers' Society of Western Pennsylvania was held in the lecture room of the society, 410 Penn avenue, Pittsburgh, Pa., Tuesday evening, November 16, 1897. The paper of the evening was a report of the Committee on Roads. The report was very elaborate, and gave exact information concerning a considerable number of types of roads with cost of labor and material. There were also illustrations given showing the methods of construction. To the regular report of the committee was subjoined a second report, consisting principally of a report on the road laws of the State of Pennsylvania. After the reading of the paper there was an animated discussion, and a great many details were brought out with respect to the methods of construction. A point strongly insisted upon was the necessity of making very full and careful preliminary surveys. It was stated that one of the great difficulties in the way of obtaining good roads was the fact that the authorities and tax payers were not willing to spend the time or money involved in making preliminary surveys.

A new road law drawn np by Arthur Kirk was referred to the Committee on Roads for examination and criticism.

The Raddatz Submarine Boat.

A successful submarine boat is reported to have been built at Oshkosh, Wis., by Richard Raddatz, a young mechanical genius of that city. It has been tested on Lake Winnebago. A local journal thus describes it :

A year ago the vessel was virtually completed and a number of voyages were made. They were successful in exposing many minor defects and one important one—the vessel was too short to handle to advantage. So last spring a middle section was inserted, increasing its length about one-third. During the last summer Raddatz and a helper have been at work testing, altering and improving, and quite recently the submarine boat was declared finished. Its shape is that of a donble cone, with a tnrret rising at the juncture, which is amidships.

The boat is 65 feet long, 4 feet wide and 7½ feet high, and is built of steel plates on a heavy framework of angle irons, with an estimated strength sufficeint to withstand safely the pressnre due to a snbmersion 500 feet deep. It carries two sets of propelling machinery, a hot air engine of 30 horse-power for use on the surface and an electric motor for propulsion beneath the surface, and a number of trials, it is claimed, have demonstrated the ability of the craft to navigate beneath the surface of the water for a day at a stretch with safety and without inconvenience to the crew. Trials have also shown that the craft can be made to rise and fall in the water at the desire of the operator and with various velocities, and a complete submersion of the boat can be made in the short space of 18 seconds, while if it be desired to hold the craft snspended in the water at any desired depth an automatic machine is provided which is capable of maintaining the ship at a given depth for hours at a time with a variation in depth of less than 1 inch from the ginn mark, either with the ship in motion or when still. As far as trials have been made all machinery has worked well irrespective of the depth at which the ship has happened to be, and it has always obeyed promptly the will of the single operator and pilot—a crew of one man being all that is necessary to navigate the vessel. Every effort has been made to insure the supply of pure and respirable air in proper qnantities to the crew, and great care has also been taken to insure the return of the craft to the surface in case of accident to the machinery of a sufficiently serious natnre to endanger the lives of the occupants. An automatic machine is provided to prevent the submersion of the craft, either by intention or accident, beyond a predetermined depth.

With its turret protruding above the water it has made 14 miles an hour, and its prow is fitted with a steel ram that wonld pierce the side of any iron steamer on the great lakes. In the turret are strong glass lenses for exploration purposes, and through a hatchway in the top of the turret is the only mode of egress or ingress. Since completed voyages have been made daily.

Rates on Steel Rails.—The following rates on steel rails have been established by the Joint Traffic Association : $4 per gross ton from Lorain, Ohio, to Montreal and $3.80 from Wheatland, Pa., to the same point. The managers of the Joint Traffic Association recommend that, effective n legal notice, the duly authorized east bound rates on new iron and steel rails, in carloads, from rail producing districts to eastbound basing rate points be also authorized on like traffic to points duly established as taking same eastbound rates, as per eastbound guide books of the various fast freight lines.

Secretary James H. Nutt and the Scale Conference Committee of the Amalgamated Association, at Youngstown, Ohio, last week examined the reports of the iron manufacturers as to the price received for iron bars during September and October. The average of prices was such that there will be no change in the Amalgamated scale for November and December.

On October 19 a meeting took place at Cologne of the manufacturers of steel of Western Germany. Many works from the Rhenish-Westphalian district, and also from the Saar district and from Lorraine-Luxemburg, were represented. There were addresses by E. Schroedter of Duesseldorf and Dr. Beumer, who urged that efforts be made to retain and develop the German export trade. A resolntion was passed expressing the conviction that drawbacks on exports of iron and steel from Germany are an effective means for maintaining a satisfactory condition of business, and particnlarly to give steady employment to the workmen. The formation of an organization on a broad foundation was advocated. Snch drawbacks must be granted by syndicates to syndicates, aiding the export merchants. It is reported that the Rhenish-Westphalian pig iron syndicate and the Rhenish-Westphalian coke syndicate have expressed their willingness to cooperate. A committee was appointed to work out details. The wire trade is one of the leading branches kept in view.

The annual meeting of the American Institute of Mining Engineers will be held at Atlantic City, N. J., on February 15, 1898. A meeting in Mexico is planned for October, 1898.

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Metal and Miscellaneous Prices.

CHICAGO, NOVEMBER 25, 1897.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style,	
36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style,	
20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade,	
12 to 14 lbs. coating	9.00@ 10.00
STP Grade,	
10 to 12 lbs. coating	8.00@ 9.00
Dean Grade,	
8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.90¢	2.50¢
17 to 20	2 00¢	2.60¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ℔ lb. A	$10.20	10% dis.
Patent Planished, ℔ lb. B	9.20	
Craig's Polished Sheet Steel		8½¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch.....36
Plain, ½ inch up to ⅝ inch.....38
Plain, ⅜ inch up to ½ inch.....41
Plain, 5-16 inch up to ⅜ inch.....08
Plain, ¼ inch up to 5-16 inch.....65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch.....38
Plain, 3 inch and larger..... ..Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in fugots for remelting.
Small lots ..... ℔ lb, 40¢
100-lb lots.....℔ lb, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....℔ lb, 34¢
100-lb lots.....℔ lb, 33¢
Nickel Aluminum Casting Metal.
Small lots.....℔ lb. 39¢
100-lb lots.....℔ lb, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....℔ lb, 35¢
100-lb lots .....℔ lb, 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....℔ lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....℔ lb, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 lb or more. Less quantities, 5¢ ℔ lb additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	℔ lb	℔ lb	℔ lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping..... .....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's..... 8¼@8½¢

Lead—

Soft Pig Lead .....4¼¢
Bar.. .....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized .....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cusbman's.....dis. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin.... ℔ square,	$4.75	$4.50
Galv..... ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....℔ lb 2 ¢
" " Brown.....℔ lb 1½¢
" " Purple .....℔ lb 2½¢
" " Ground in oil, B. Red, ℔ lb 6½¢
" " Ground in oil, Red...℔ lb 6½¢
" " Ground in oil, Brown, ℔ lb 5½¢
" " Ground in oil, Purple, ℔ lb 6½¢
Linseed Oil, Boiled, in bbls.....37¢
Linseed Oil, Raw, in bbls.....35¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal..34½¢
Asphaltum, Trinidad Refined, ℔ ton.$45
Tarred Felt, 1 Ply, ℔ 100 lb.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl. of 300 lb.....$3.00

NEW YORK, NOVEMBER 26.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₱ ℔, 40¢
100-℔ lots.....₱ ℔, 36¢
Aluminum Rods, from ¼-in diam. to 1 in. diam.....₱ ℔, 53¢
Aluminum Sheet, B. & S. gauge. In lots of 50 ℔s or more.

And including	6-in. ₱ ℔	14-in. ₱ ℔.	24-in. ₱ ℔.
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.42	.45
" 21 to 23	.42	.44	.47
" 24	.42	.46	.49
" 25	.43	.47	.50
" 26	.43	.50	.55
" 27	.44	.53	.58
" 28	.44	.53	.60
" 29	.45	.56	.65
" 30	.46	.60	.73

Note.—Lots of less than 50 ℔s 5¢ ₱ ℔ extra.

Antimony—

Cookson.....₱ ℔, 8½@8¾¢
Hallett's.....₱ ℔, 7¾@8¢
Japanese.....₱ ℔, 7½¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per ℔.	
¼-in. up to 2-in.	$0.35	35% off.
⅛-in. up to ¼-in.	.36	
⅛-in. up to ⅝-in.	.38	
⅛-in. up to ½-in.	.41	
5-16-in. up to ⅝-in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3-in. and larger.	Special	
2-in. to 3-in., to No. 19, inclusive	.38	

Copper & Bronze Tubing—

3¢ ₱ ℔ more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₱ ℔ 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₱ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4¼	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%

Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common Americaa.	R. G. Cleaned Americaa.
Nos. 10 to 16.....₱ ℔, 2.00....	2.30¢	
Nos. 17 to 21.....₱ ℔, 2.10....	2.40¢	
Nos. 22 to 24.....₱ ℔, 2.20....	2.50¢	
Nos. 25 and 26...₱ ℔, 2.30....	2.60¢	
No. 27.....₱ ℔, 2.40....	2.70¢	
No. 28.....₱ ℔, 2.50....	2.80¢	
Americaa B. B.....₱ ℔, 4¢		

Russia, Planished, &c.
Genuine Russia, according to assortment.....₱ ℔, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₱ ℔, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₱ ℔ 8½¢

Galvanized.

Nos. 10 to 16	₱ ℔, 12¢	75&10% 5% off.
Nos. 17 to 21	₱ ℔, 13¢	
Nos. 22 to 24	₱ ℔, 14¢	
Nos. 25 to 26	₱ ℔, 15¢	
No. 27	₱ ℔, 16¢	
No. 28	₱ ℔, 17¢	
No. 29	₱ ℔, 18¢	
No. 30	₱ ℔, 21¢	

36 in. 1¢ ₱ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4¾¢
Bar.....5¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....12 ₰¢, 20%
Block Tin Pipe.....30¢, 20%
Sheet.....6¾¢, 20%
Old Lead in exchange, 3¼¢ ₱ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ⅝ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American.....@1½¢
Red Venetian, American.....@1¾¢
Linseed Oil:
Raw, ₱ gal.....40¢
Boiled.....42¢
Spirits Turpentine:
In bbls.....33@33½¢
In cases.....41@41½¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₱ ℔ 5 ¢
Clarified.....₱ ℔ 4¾¢
Accra.....₱ ℔ 4¾¢
Half Jack.....₱ ℔ 4½¢
Cecilia.....₱ 100 ℔ $4.85
Choice Red.....₱ 100 ℔ 4.60
(*Spot Oil, ¼¢. ₱ ℔ higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline.....₱ gal. 10@11¢
Kerosene.....₱ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints)..70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves, 70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves..65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Pumbers' Jog, 50¢ ₱ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&5%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....55%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated.....40&10%
Solid Bronze.....25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%

1896 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₱ ton.....$30.00@$35.00
Asphaltum, Rock, ₱ ton.....$14.00
Coal Tar Felt, 1 ply, ₱ ℔.....2¢
2 Ply Roofing, ₱ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₱ roll, 108 sq. ft.....1.35
Roofing Pitch, ₱ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.	₱ bbl.	$1.82@$1.83
Rosin, E. & F.	₱ bbl.	1.84@ 1.87
Rosin, G. & H.	₱ bbl.	1.90@ 1.95
Rosin, I. & K.	₱ bbl.	2.00@ 2.05
Rosin, M. & N.	₱ bbl.	2.10@ 2.25

Seamless Brass Tubes—

Net List, Feb. 1. 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₱ sqr.	$3.75@$5.00
No. 1 Bangor Ribbon	3.35@ 3.75
Pen Argyle, ₱ sqr.	3.75@ 4.35
Peach Bottom, ₱ sqr.	4.75@ 5.60
No. 1 Chapman, ₱ sqr.	3.80@ 4.80
Lehigh Slates, ₱ sqr.	3.00@ 4.50

Vermont:

Sea Green, ₱ sqr.	$2.50@$3.55
Purple, ₱ sqr.	3.25@ 4.00
Unfading Green, ₱ sqr.	3.75@ 4.50
Red, ₱ sqr.	9.00@11.00

Solder and Soldering Fluids— Solder—

½&¼ guaranteed.....10¾@11¢
No. 1.....9¾@10½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔, ₱ ℔.....3½¢ (5% dis.)
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₱ ℔.....4¢ (5% dis.)

Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, ₱ ℔.....40¢

Soldering Coppers—

Per ℔.....15½¢@17½¢ net

Spelter—

Western Spelter.....4.65@4¾¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₱ ℔.....15½¢
Straits, pigs, ₱ ℔.....14¾¢
Straits, in bars, ₱ ℔.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	1X,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	1XXX,	14 x 20	7.75
" "	1XXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	1XXX,	14 x 20	6.50
" "	1XXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔	10¢
95 ℔	15
90 ℔	20¢
85 ℔	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. 1X is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating	8.00 @ 9.25
STP Grade, 10 to 12 ℔ coating	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)	$9.10
IXX, 14 x 28..(112 sheets)	9.80
IXX, 14 x 31..(112 sheets)	10.85

Tin Plates, Imported—

Duty, 1½¢ ₱ ℔.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20	$5.00
" "	1X,	14 x 20	6.00
Allaway Grade,	1C,	14 x 20	4.25
" "	1X,	14 x 20	5.00

Coke Plates, Bright—

Steel Coke,	1C, 14 x 20	$4.25
	1X, 14 x 20	5.25

Terne Plates—

MF,	IC, 14 x 20	$6.25
	20 x 28	12.50
Worcester Grade,	1C, 14 x 20	4.25
	20 x 28	8.50
Dean Grade,	1C, 14 x 20	4.00
	20 x 28	8.00
Gilbertson's Old Method,	1C, 14 x 20	7.50
	20 x 28	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz.....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved pattern, ₱ doz.....18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain	72%
1¼ and less, Galv.	67%
1½ and larger, Plain	78%
1½ and larger, Galv.	70%
Screw and Socket Joint Casing	65%
Inserted Joint Casing	60%
Boiler Tubes, 2¼ inch and smaller	72½%
" 2½ inch and larger	75%

Zinc—

600 ℔ casks ₱ ℔ 5¾¢ | Per ℔.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son, Utica, N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.

Architectural Ornaments.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Weitzel, J. F., Cincinnati, Ohio.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Ash Sifters.
Cleveland Stamping & Tool Co., Cleveland, Ohio.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Copper.
Randolph & Clowes, Waterbury, Conn.

Boilers, Range.
Wolff, L. Mfg. Co., Chicago, Ill.

Books.
Tower, F. W., Springfield, Mass.

Building Paper
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Fraud, Martiu J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Cautou Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh Pa.
Marlin & Co., Pittsburgh, Pa.
Weitzel, J. F., Cincinnati, Ohio.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 2 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Martin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Seiner & Co., Indianapolis, Ind.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Dinner Pails.
Kieckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers, L. M & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio

Egg Beaters.
Standard Co., Boston, Mass.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Excelsior Steel Furnace Co., Chicago, Ill.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Buckwalter Stove Co., Royersford, Pa.
Carton Furnace Co., Utica, N. Y.
Clark, Henry N. Co., Boston, Mass.
Excelsior Steel Furnace Co., Chicago, Ill.
Fox Furnace Co., Cleveland, O.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Mt. Penn Stove Works, Reading, Pa.
Pease, J. F., Fuce Co., Syracuse, N. Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass
Schwab & Sercomb, Milwaukee, Wis.
Shenpard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Superior Fdry. Co., Little Falls, N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Turner Heater Co., Bristol, Ct.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Hull, M. L., Cleveland, O.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Galvanizing.
Gregory, Thos, Galvanizing Works, Brooklyn, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Grinding Mills.
Straub, A. W. & Co., Phila., Pa.

Gutter Formers.
Whelan, Dennis. J., Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Empire Heating Co., Easton, Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Johnson & Co., 84 John St., N. Y.
Magee Furnace Co., Boston, Mass.
Mitchell Heater Co., Poughkeepsie, N. Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fuce Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

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Griswold Mfg. Co., Erie, Pa.
Kieckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
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Illinois Pure Aluminum Co., Lemont, Ill.

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Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

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Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lard Cans.
Kieckhefer Bros. Co., Milwaukee, Wis.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Stockhoff Heating Supplies Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Huse, Jos. & Son, Boston, Mass.
Munsell, Eugene & Co., 218 Water St., New York.

Nickel Plating Outfits.
Eddy Electric Mfg Co., Windsor, Conn.
Hanson & VanWinkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

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Blodgett, G. S. Co., Burlington, Vt.

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Stocking, E. B., Washington, D. C.

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Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

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Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

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Eclipse Refrigerator Works, Burlington, Vt.

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Roofing, Terne.
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Dixon, Jos. Crucible Co., Jersey City, N. J.
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Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

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Dwight Slate Machine Co., Hartford, Ct.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Obl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
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Stiles & Parker Press Co., Brooklyn, N. Y.
Universal Machine Co., Canton, Ohio.
West Mfg. Co., Buffalo, N
Whelan, Dennis J., Troy, N. Y.

Sheet Metal Work.

Weltzel, J. F., Cincinnati, Ohio.

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Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.

Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.

Colwell Lead Co., 03 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Slaters' Tools.

Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

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McClure & Co., Pittsburgh, Pa.
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Stamped Ware.

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Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.

Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

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Brauer, A. G., St. Louis, Mo.
Clark, Henry N. Co, Boston, Mass.
Kieffer Bros., Syracuse, N. Y.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Morris, J. L., Chicago, Ill.

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Buckwalter Stove Co., Royersford, Pa.
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Champion Steel Range Co., Cleveland, Ohio.
Charter Oak Stove & Range Co., St. Louis, Mo.
Clark, Chas. E., Chicago, Ill.
Eclipse Stove Co., Mansfield, O.
Graff & Co., 208 Water St., N. Y.
Magee Furnace Co., Boston, Mass.
Marion Stove Co., Marion, Ind.
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Sheppard, Isaac A. & Co., Phila., Pa.
Somerset Stove Foundry Co, Somerset, Mass.
Thatcher Furnace Co., 240 Water St., New York.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.

Bradley, Munk & Co., Columbus, O.
Reineke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Ringen Stove Co., St. Louis, Mo.

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Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

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Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Obl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

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Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lishon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Ine., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.

Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.

Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
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Randolph & Clowes, Waterbury, Conn.

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Canton Steel Roofing Co., Canton, O.
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Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

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Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.

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Colwell Lead Co., 63 Centre St., N. Y.
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Kenney Sanitary Mfg. Co, 47 Dey St., N. Y.
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Wolff, L. Mfg. Co., Chicago, Ill.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

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Zinc, Sheet.

Phelps, Dodge & Co., 11 Cliff St., N. Y.

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HELP WANTED.

A first-class SALESMAN to cover New Jersey and Eastern and Northwestern Pennsylvania, by manufacturer of a full line of stoves and furnaces; state experience and other particulars to "Pennsylvania," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Nov. 27

At once a double entry BOOKKEEPER, lady preferred, who is acquainted with the heating and plumbing business; location 30 miles from Boston, in a town of 10,000 inhabitants; state references, experience and wages expected. "G. W. J.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 27

A good TINSMITH and PLUMBER; steady job at $2 per day for a good man; none other need apply. J. E. Johnson, Geneseo, N. Y. Nov. 27

A good TINSMITH, accustomed to roofing, spouting, plain piping, sheet iron and pump work; permanent position for the right man; none but sober and reliable men need apply. S. M. Lawrence, Cato, N. Y. Nov. 20

A Western manufacturer of furnaces and ranges, now located in New York, who works only the wholesale trade, wants an arrangement with a practical, live man with experience and ability to conduct the architect and building part of the trade; an equitable and profitable arrangement can be made to right man. "Western," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

By a large stove manufacturing house a SALESMAN to travel in Central and Western New York, who is thoroughly well acquainted with the trade; give references, salary desired, &c. "A. B.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

A first-class TINNER; accustomed to all kinds of job work; must be able to do slate, lead and iron work; state wages. Jacob Schlosser, 207 Court street, Hamilton, Ohio. Nov. 20

SALESMAN to sell on commission enamoled ware and cutlery as side lines; enameled ware sold from catalogue and pocket sample, cutlery from sample roll; state territory or no attention. "Side Lines," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

To correspond with good CORNICE WORKERS and general workmen in sheet metal work. Write, stating experience, &c., Union Sheet Metal Works, 347-349-351 Central avenue, Los Angeles, Cal. Nov. 20

SITUATIONS WANTED.

Steady position by a young man 30 years of age, who is a first-class PLUMBER and can do all kinds of tinning, steam and hot water heating—in fact, has been used to all branches of the trade. E. Palmer, 162 Main street, Norwalk, Conn. Nov. 27

AS FOREMAN in stove pattern shop, drafting, designing and carving; first-class pattern maker; 12 years' experience as foreman; best of references furnished. "W. B. B.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 27

As TRAVELING AGENT for a house manufacturing or handling a full line of tin plate or tinners' stock; 13 years on the road with a good established trade in Middle and Western States. Address S. G. Williams, 409 Congress street E., Detroit, Mich. Nov. 27

A party thoroughly familiar with the construction and operation of enameling plants for stamped ware (sheet iron or steel), iron signs and cast iron or copper articles, wishes to correspond with a concern intending to build such a plant; thoroughly experienced with the manufacture of high grade enamels in all colors. "Enamel," office of *The Metal Worker*, 232-238 William street, New York City Nov. 27

By a PLUMBER who has had three years' experience; also understands tinsmithing; can wipe a good joint. R. B. Robinson, Center Moriches, L. I. Nov. 27

STORE and FURNACE SALESMAN open to engagement; well acquainted in the trade; best of references. J. McK. Reiley, 262 Herr street, Harrisburg, Pa. Nov. 27

By a TINNER a steady position; will work for moderate wages; has had 12 years' experience in general jobbing, in and outside work; can furnish good reference. W. E. Benninger, Garrett, Ind. Nov. 27

A GOLD, SILVER, NICKEL, BRASS and BRONZE PLATER of over 20 years' experience would like position with some company who can appreciate good work; am strictly temperate. "Plater." Box 10, Oakville, Conn. Nov. 27

By January 1, 1898, position as FOUNDRY FOREMAN or GENERAL SUPERINTENDENT of stove works; am well up in all branches of stove and range manufacture, piece work rates and modern foundry practice; good references. "C. A.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 27

As FOREMAN of a cornice, metal skylights and general jobbing shop, having held a similar position for a number of years; also capable of estimating from architect's drawings. Jno. F. Preuthm, 2118 Newkirk street, Philadelphia, Pa. Nov. 27

AI practical DIE and TOOL MAKER well up in all latest improved dies and tools for novelty and general hardware; dies for blanking, drawing, stamping, forging, &c., for all sheet metals, as brass, iron, steel and aluminum; well up in modern shop methods to increase production; also automatic dies, feeds, stops, &c.; can design and develop ideas; 10 years' experience in best shops in Massachusetts and Connecticut; age 30; can accept January 1, 1898; best references as to ability and character. "Die Maker," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 27

By a good TIN and SHEET IRON WORKER able to do tin roofing, heating, gas fitting and general jobbing; 12 years' experience; married, steady and sober; in or around New York preferred. W. Pohland, 374 Spring street, West Hoboken, N. J. Nov. 27

By a first-class PLUMBER; both lead and brass worker; furnaces, roofing, gas fitting; also do some hot water heating; AI references; estimate on all kinds of work; 15 years at business. A. J. Lawrence, Station A, P. O., South End, Boston, Mass. Nov. 27

By a man with 15 years' experience position as SUPERINTENDENT of foundry making stoves and ranges or steam and water heating boilers; a practical molder with a thorough knowledge of the foundry business; competent to look after every department from the cupola to the finished stove; can handle help to advantage and give the best of references as to character and ability. "Superintendent No. 1127," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 27

By first-class LEAD and BRASS PLUMBER who can do furnace and general jobbing; have been in business and understands estimating on work; first-class references: New York State preferred; state wages. J. A. Rober, 62 Hammond street, Boston, Mass. Nov. 27

By a first-class PLUMBER; can do steam and hot water heating, tin roofing, gutter work; steady, reliable man; good reference from former employers. "D. A.," 23 Prospect street, Worcester, Mass. Nov. 27

PLUMBER, young man 26 years of age, wishes to obtain steady place in New York or vicinity; nine years' experience in lead and iron pipe work, gas and low pressure steam heating; understands plans and rules of Board of Health; will work for reasonable wages. "Plumber," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

With some good house as a SALESMAN; 15 years' experience in hardware, tin and stoves; can speak German and English. "German," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

As FOUNDRYMAN; ten years' experience on extra finish and plain hollow ware, eight years' on all kinds of machinery and job molding, and two years' on stove plate. Henry Gack, Sidney, Ohio. Nov. 20

Steady work on stove and furnace patterns by an experienced iron stove PATTERN FITTER. Frank Hamburger, 23 Earl place, Buffalo, N. Y. Nov. 20

By a BRASS MOLDER; 15 years' experience on plumbing supplies and steam work; capable of taking charge; first-class references; city or country. Daniel Norman, 214 South street, Boston, Mass. Nov. 20

By a sober, reliable man as a general all round helper for hardware, stoves, tinware or ordinary tinning; small wages for steady work "J. H. B.," Box 315, Walkerton, Ind. Nov. 20

By a young man as PLUMBER and GAS FITTER; 12 years' experience in city and country; strictly temperate; steady position desired. "F. S.," Saratoga Springs, N. Y. Nov. 20

BOOKKEEPER, CREDIT and COLLECTION MAN of 14 years' experience with one firm is open for engagement; possessing energy, business abilities and references of the highest character. "Punctuality," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

As BUSINESS MANAGER or SALES MANAGER; thoroughly understands the stove business in all departments; first-class references given; employed at present, but desires to make a change. "Duplex," office of *The Metal Worker*, 232-238 William street, Now York City. Nov. 20

By a first-class PATTERN FITTER with a first-class stove works as foreman; can take full charge of pattern or mounting shop; best of references. "S.," No. 1120, office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

By a first-class TIN and SHEET IRON WORKER for in and outside work; experienced in mill work, blow pipe, ventilating, furnace and range work, roofing, &c.; can draw own patterns; 28 years of age; married; sober and reliable. M. Bloom, 106 East Broadway, New York City. Nov. 20

By a young man who has had six years' experience at plumbing, gas, steam and hot water fitting, also roofing, guttering, spouting, range, furnace and iron pump work; would like steady job; New York or New England States preferred. J. H. Healey, 19 Water street, Ansonia, Conn. Nov. 20

By TIN and SHEET METAL WORKER; good workman; situation in factory or shop on inside work; all round experience, 15 years in English factories, 15 years in this country; large experience in weather vanes and copper finials; accustomed to work from drawings. Wm. Thomas, P O. Box 420, Peterboro, N. H. Nov. 20

American, 40, with several years' experience as a salesman, local and traveling, and manager of a corporation's business in this city, well acquainted with jobbers and retailers of hardware, stoves, tin, &c., throughout the Middle and Eastern States, is open for engagement as MANAGER of branch house or to fill similar position; not averse to representing good house on commission basis with exclusive territory; AI credentials. "Business Developer," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

SALESMAN would like to engage for the year 1898 to represent a line of hardware specialties, tinware, tinners' supplies, &c., on the road; salary or commission. Box 146, Morrison, Ill. Nov. 20

Steady position by a PLUMBER and GAS FITTER; first-class workman; ten years' reference from last employer. "A. O. M.," 13 Valley street, Worcester, Mass. Nov. 20

Steady position by a young man, single, sober and steady, who is a good general jobber at tinning, plumbing and iron pipe work; ten years' experience; city or country. Jos. Brooks, 160 Walnut street, Bloomfield, N. J. Nov. 20

By practical CORNICE MAKER, TINNER and FURNACE MAN; good cutter and capable of taking charge of shop; 15 years at trade and five years' business experience; married and sober; desires position in Central States. "A. B. C.," 288 South Lake street, Aurora, Ill. Nov. 20

STOVE PATTERN MAKER, artistic carver and designer, with 20 years' experience, wants to make an engagement with some stove foundry in altering and redressing the wood patterns up to the present time; will give references and photos of his abillity in getting up new work. "Expert," Troy Artistic Stove Pattern Works, 458 River street, Troy, N. Y. Nov. 20

Hardware and stove SALESMAN with exceptional references desires change; West preferred. "L. V. C.," care Messenger Hotel, Port Huron, Mich. Nov. 20

Young man, 22 years of age, competent DRAFTSMAN, six years' experience in all lines of drafting, mostly architectural, also having office experience, desires a position of any kind; salary, $10 per week, with chance for advancement; good reference. "W. B.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 20

An experienced and practical foundryman, particularly in the specialties of stove plate, furnace and core work incident to steam and hot water heaters, would like to correspond with a first class manufacturer desiring to engage the services of a FOREMAN or SUPERINTENDENT of a foundry; has served several years in such capacity, but has good reasons for seeking a change; is familiar with cupola practice and core making and core work; could command a good corps of molders skilled in the specialties referred to; could enter upon service January 1 or possibly earlier; would be able to furnish satisfactory references. Address "Foundryman," 55 East Newton street, Boston, Mass. Nov. 20

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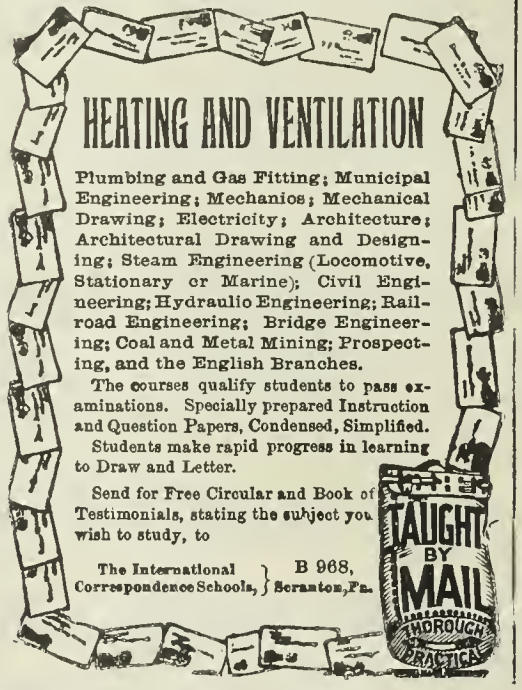
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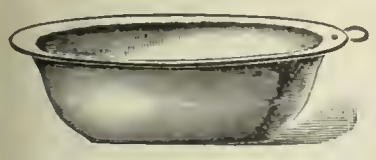

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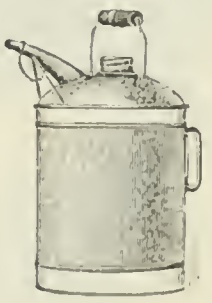

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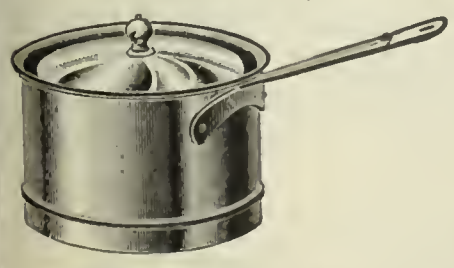

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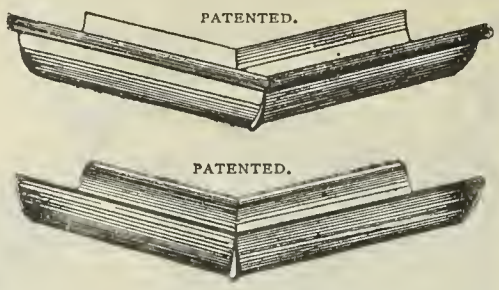

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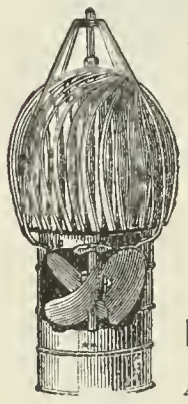

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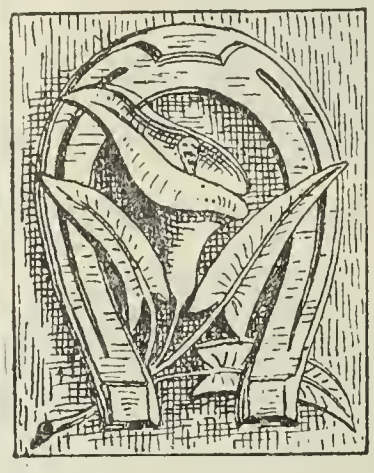

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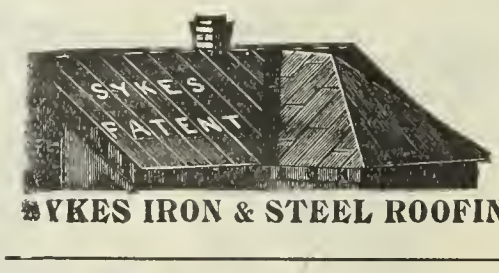

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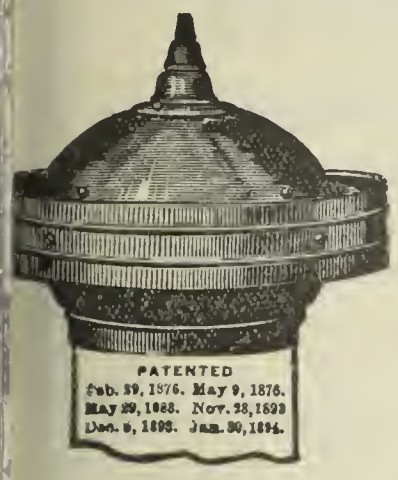

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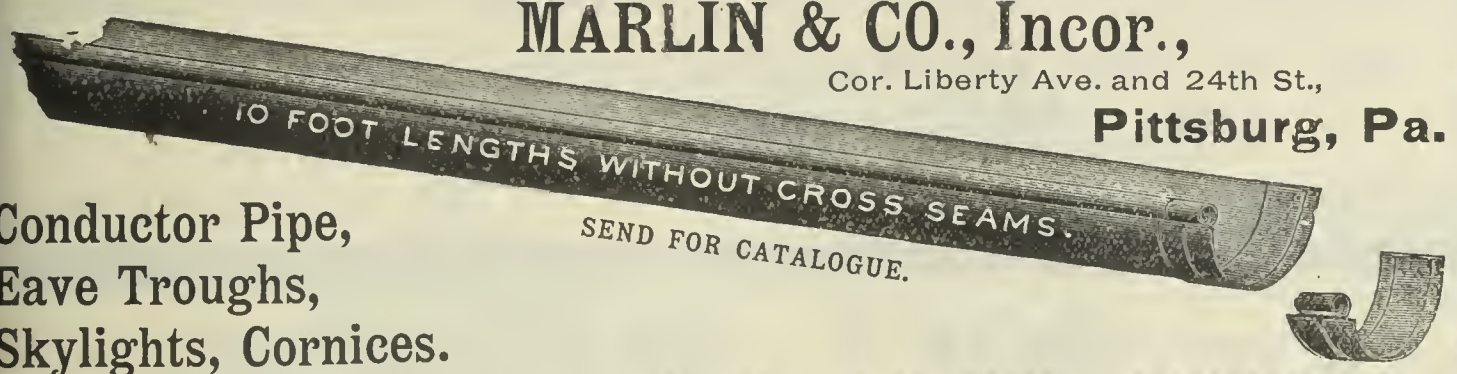

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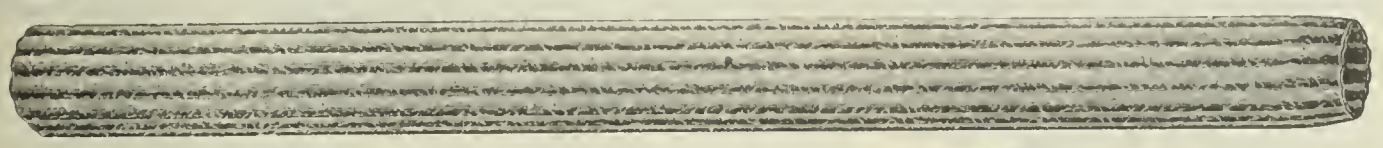

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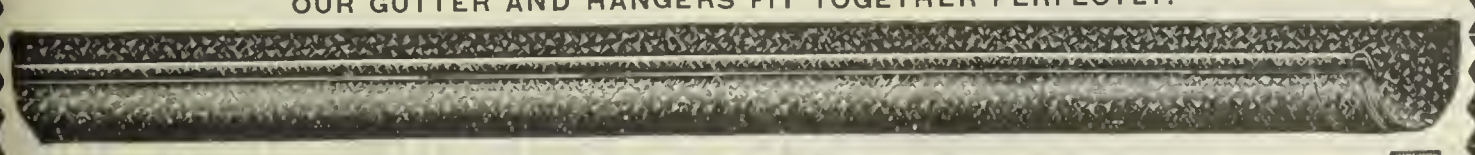

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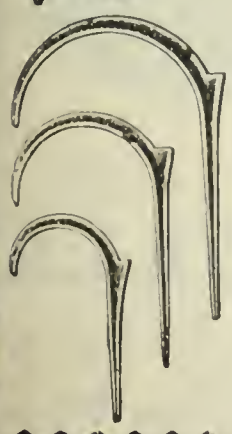

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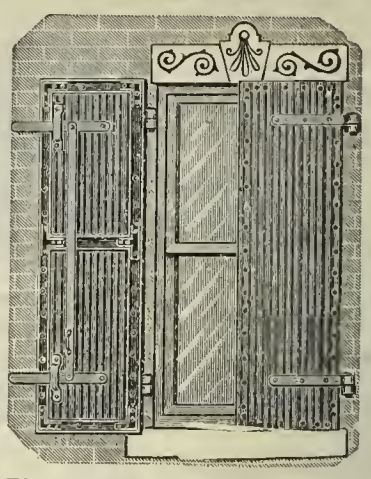

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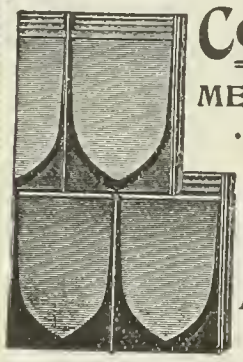

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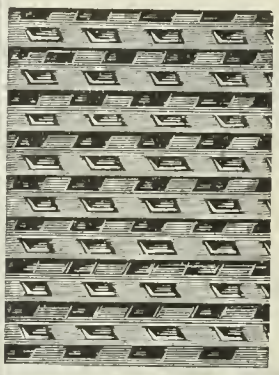

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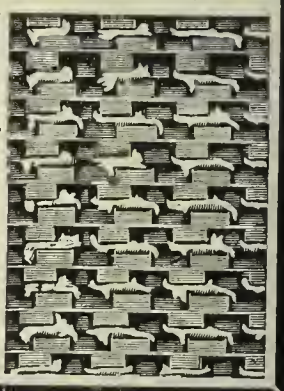

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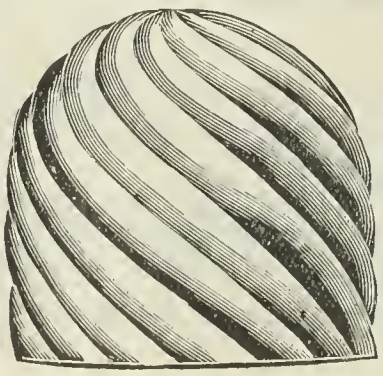

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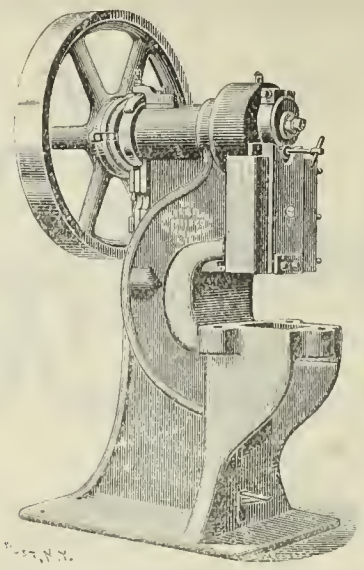

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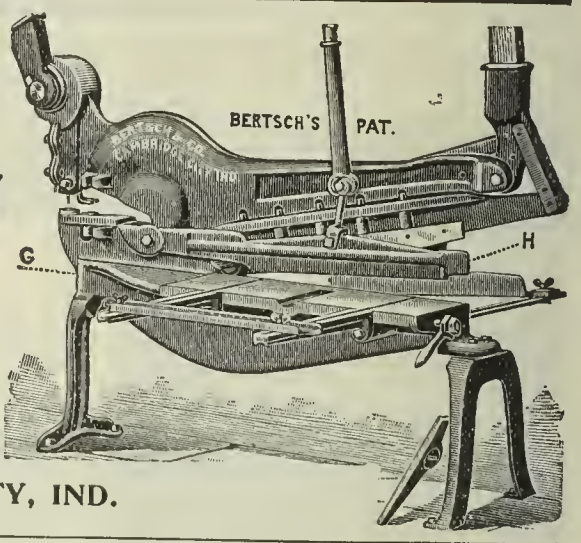

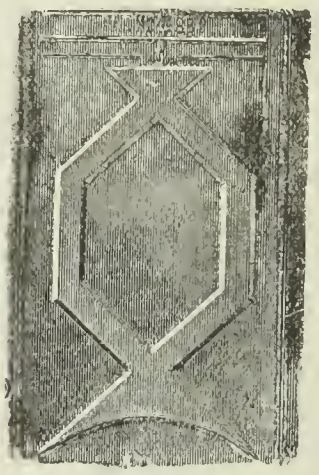

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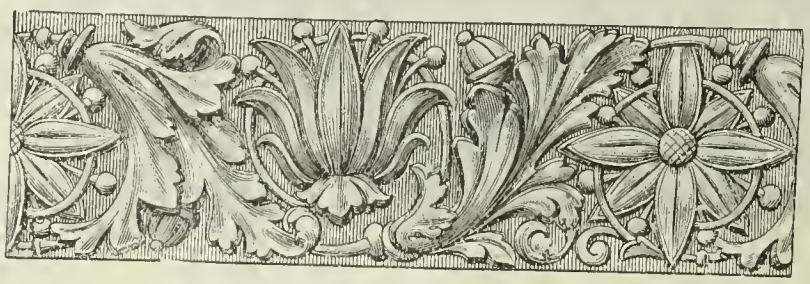

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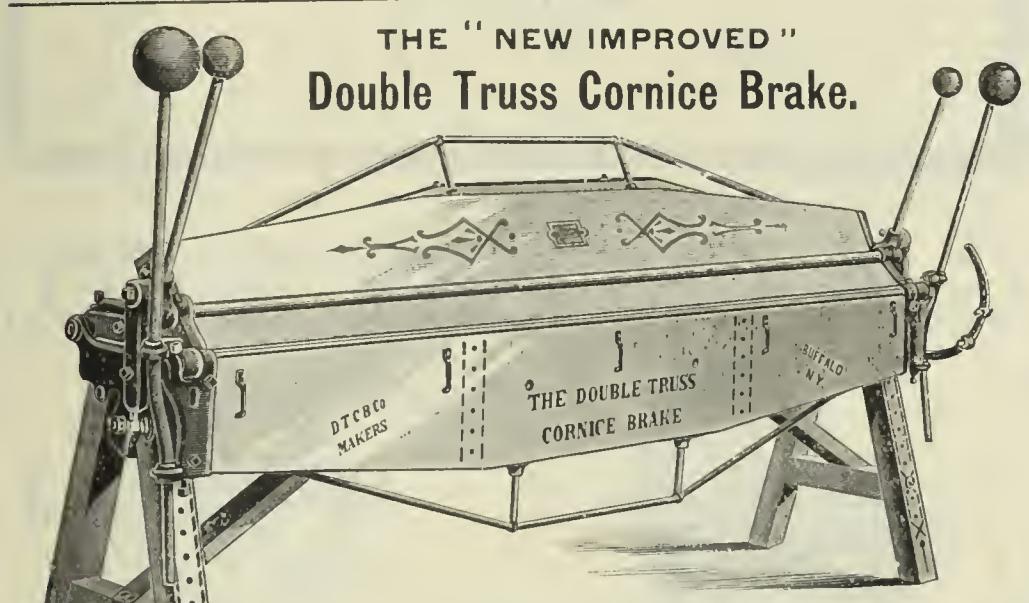

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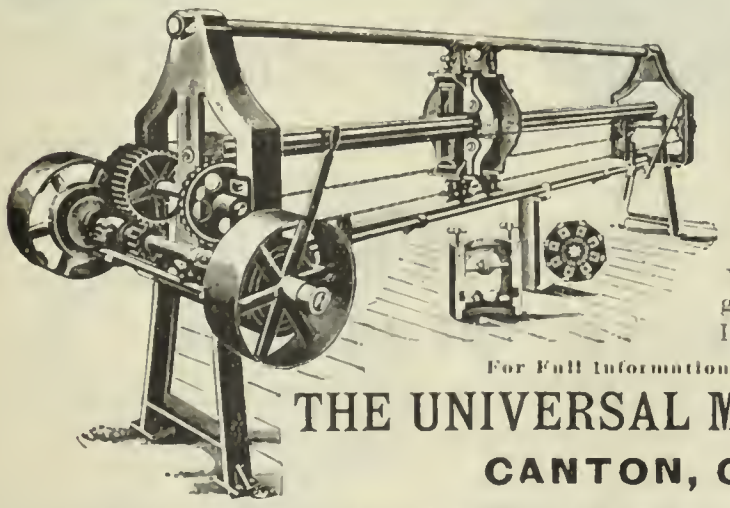

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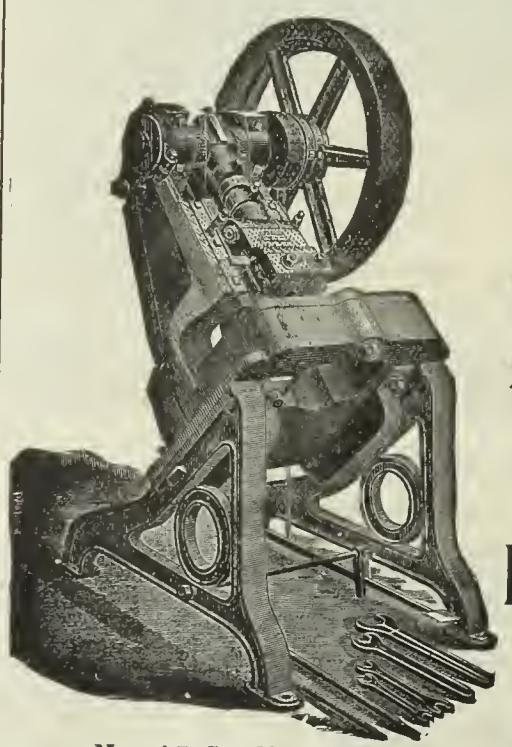

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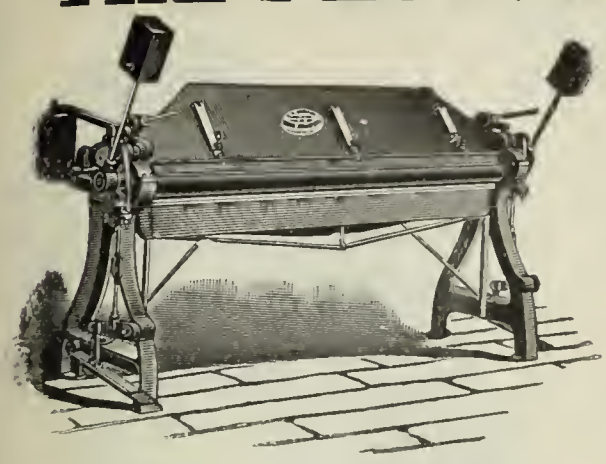

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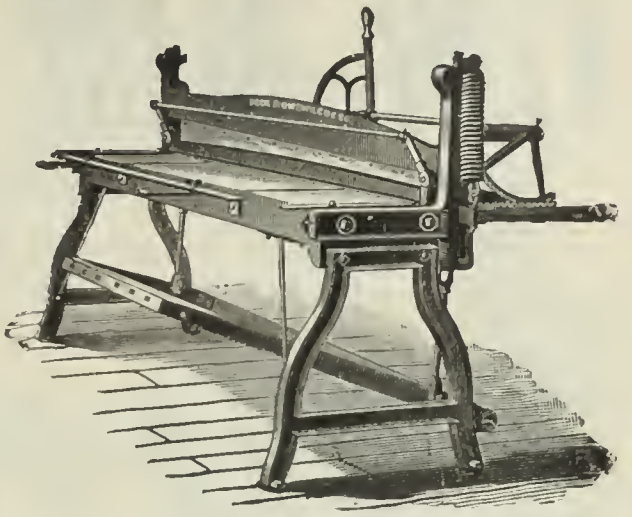

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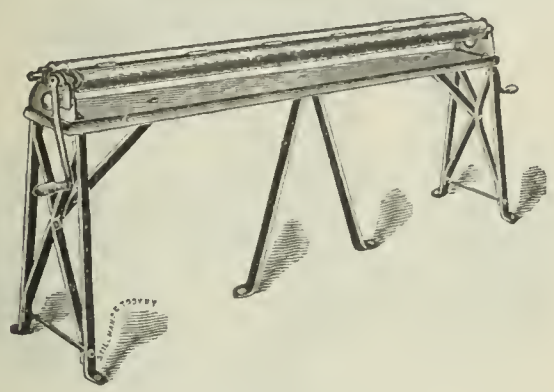

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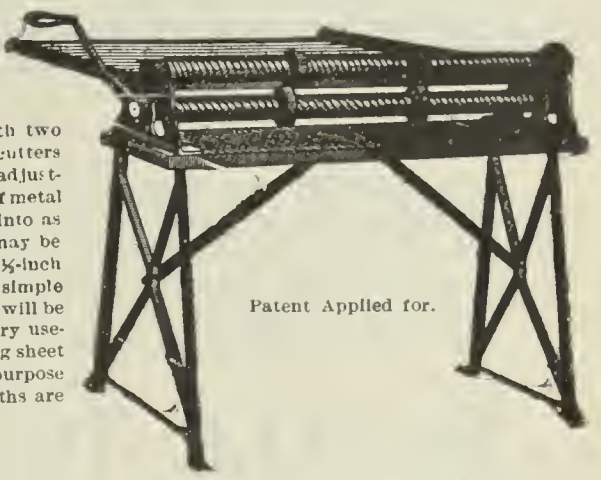

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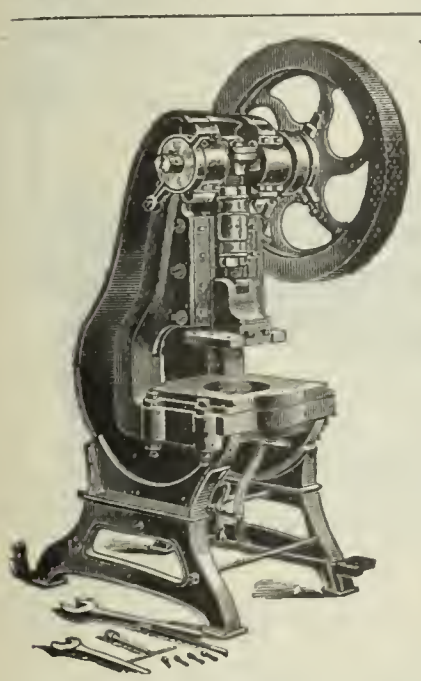

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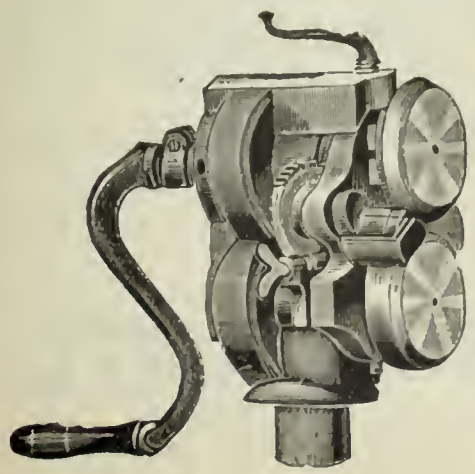

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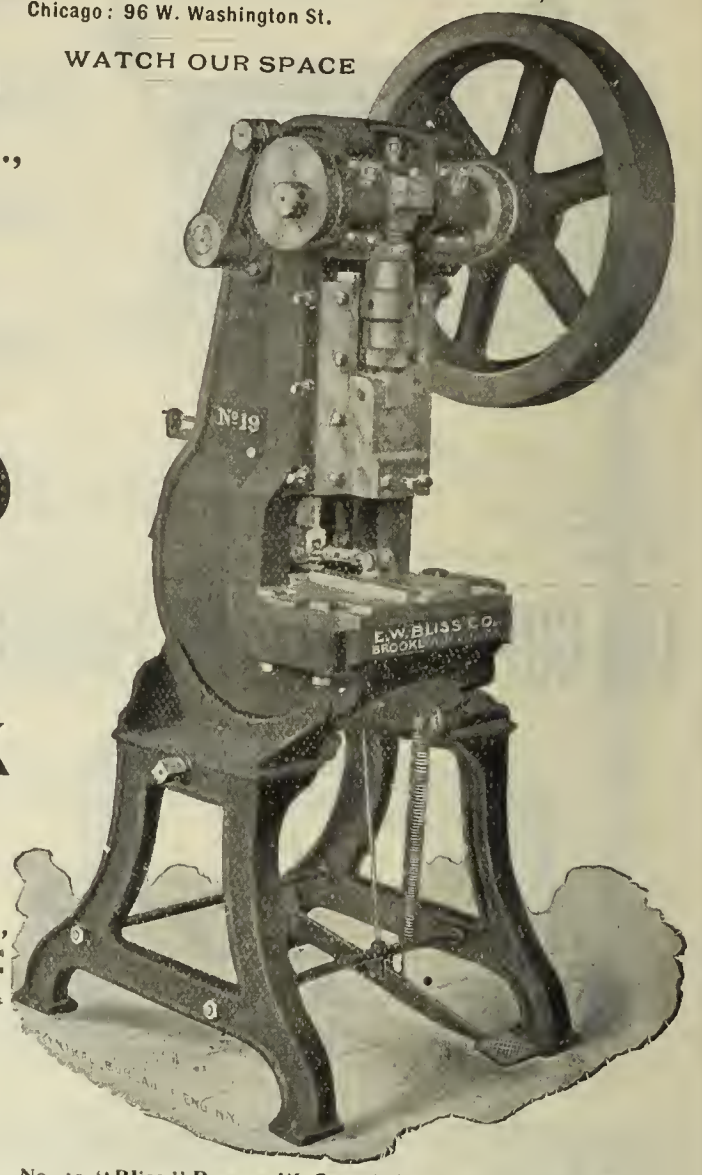

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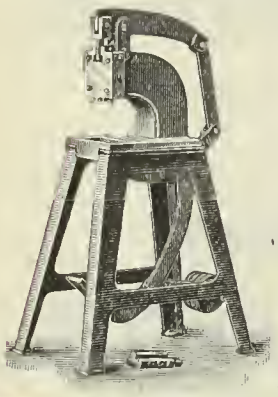

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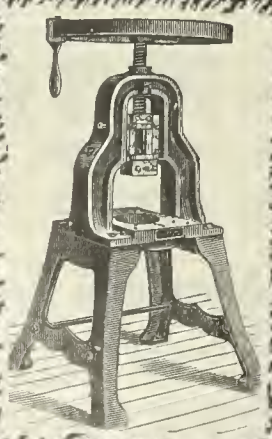

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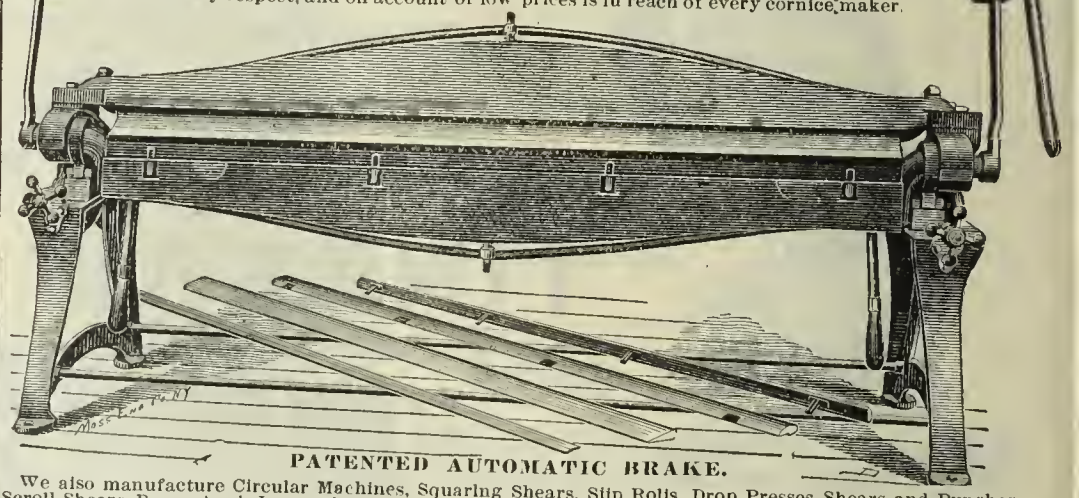

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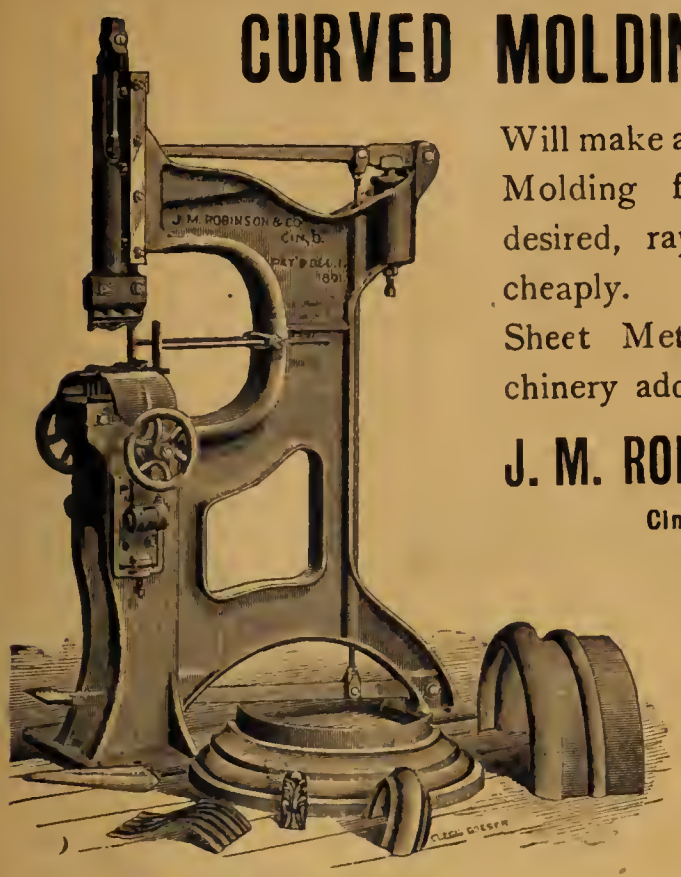

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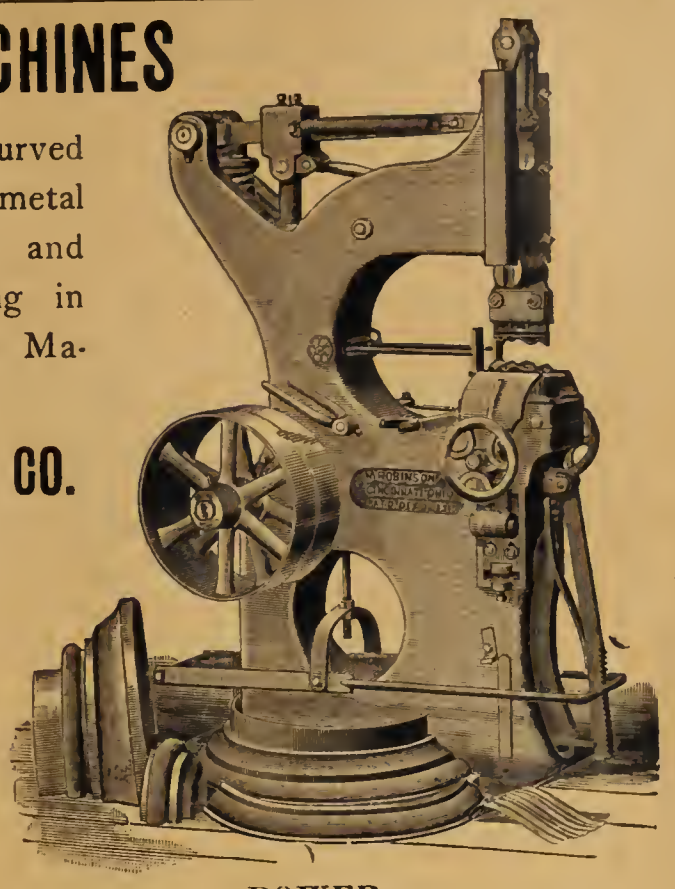

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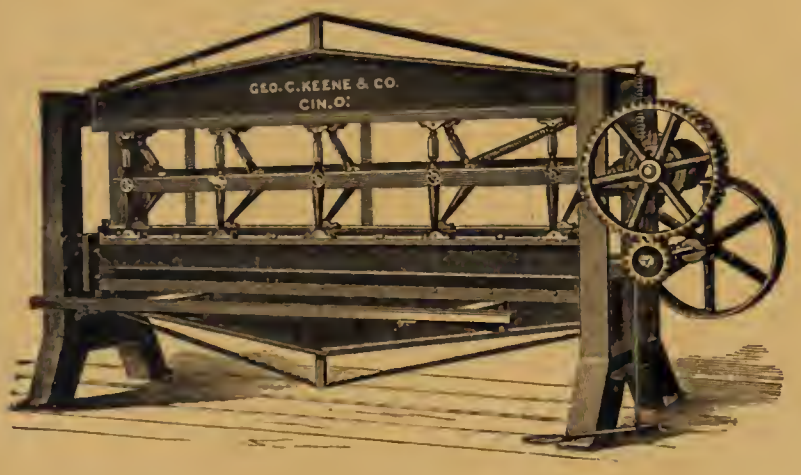

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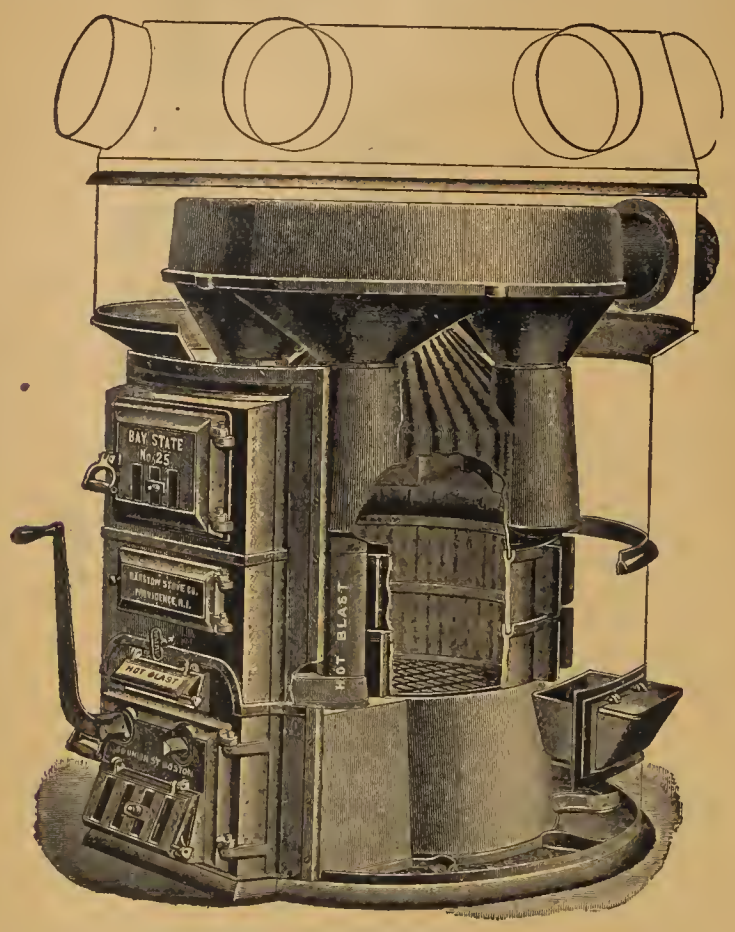

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American Made. Guaranteed Superior Quality.

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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. XLVIII. NUMBER 23.

NEW YORK AND CHICAGO, DECEMBER 4, 1897.

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We furnish these tested to 200 pounds and guaranteed against collapse, and for use under heavy pressure. They cost a little more than iron, but are not only more durable but have a value as old copper which is a handsome percentage of cost.

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Pump Governors, Steam Traps, Steam and Water Reducing Valves, Tank Temperature Regulators, Noiseless Back Pressure Valves, Water Arches, and Oil Separators. Controller.

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"Quick Meal" Gas Stoves.
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For the season of 1898 the Burner of the Regular "Quick Meal" Junior line will have added to its Lighting Cup a device to make its Flame burn almost blue and entirely free from Smoke. Add to this the superiority of the Turn-down Safety Tank—preventing all danger of accident—and the patent "Quick Meal" Lever for operating the Valve and the advantages of the "Quick Meal" Junior over other so-called "Cheap Junior Stoves" become so apparent—they are so many and so decided—that no dealer considering his own interest (as to profits that can be made as well as the satisfaction the stove will give his customers) should ever think of selling a Cheap Junior, a stove devoid of safety, devoid of merit, devoid of profit, devoid of satisfaction.

For purchasers who are able to pay a reasonable price there is nothing like the "Quick Meal" Evaporator. It stands at the head, it pays the Dealer a good profit and it never fails to act as a missionary in making sales.

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EVERY SQUARE INCH OF

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Of this FURNACE is

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Self TRENCH PLATING Radiator.

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NO BOLTS.

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They're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

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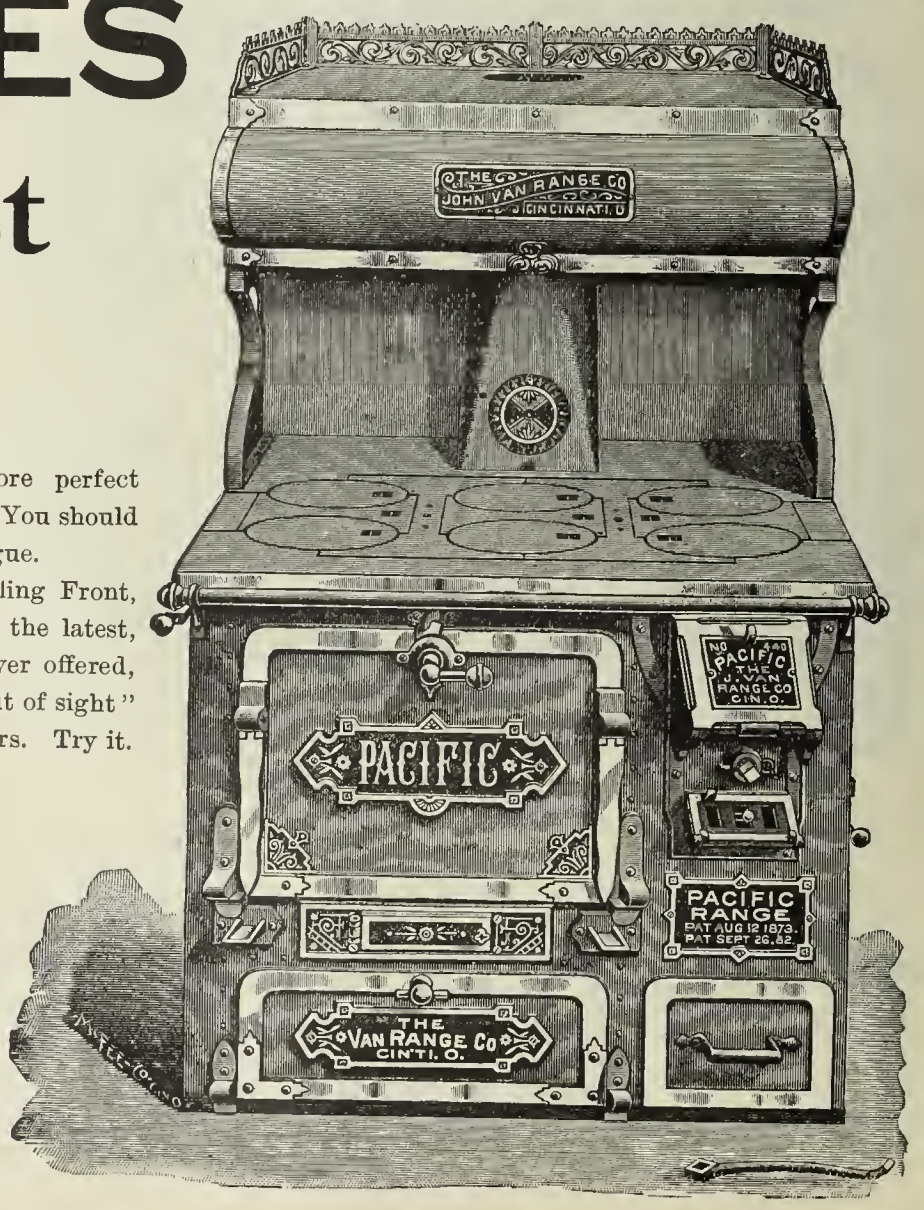

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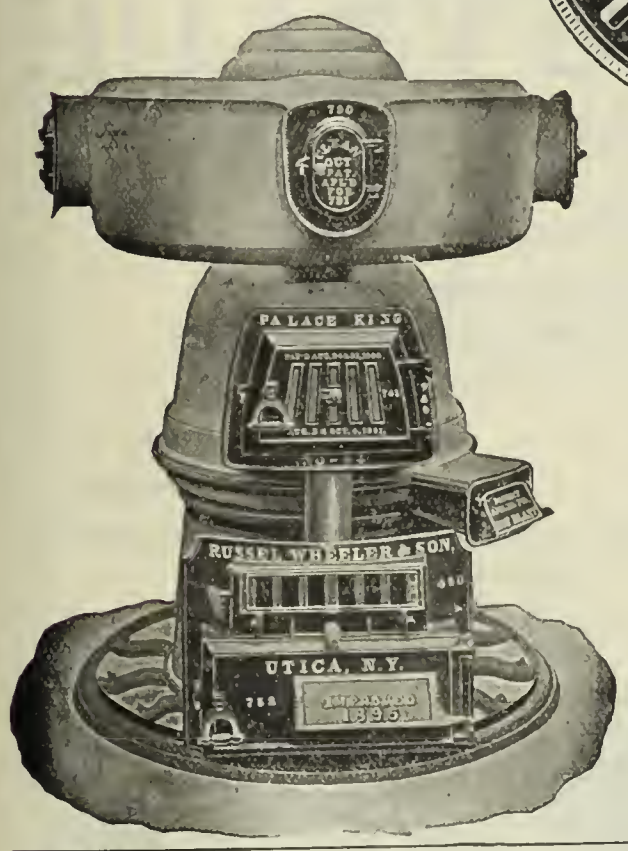

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Very truly,
I. N. EVANS.

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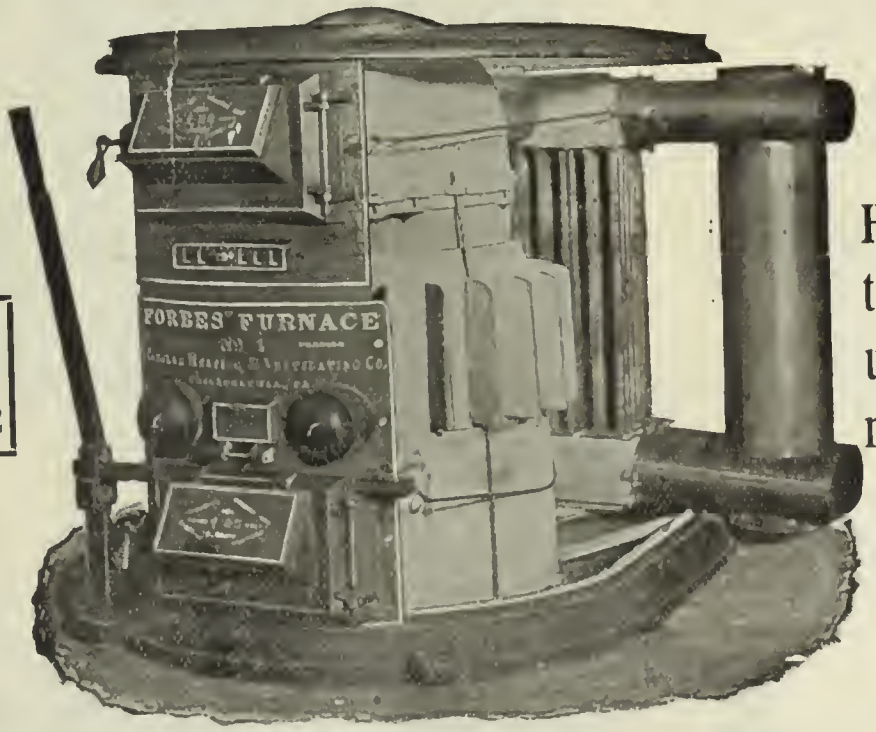

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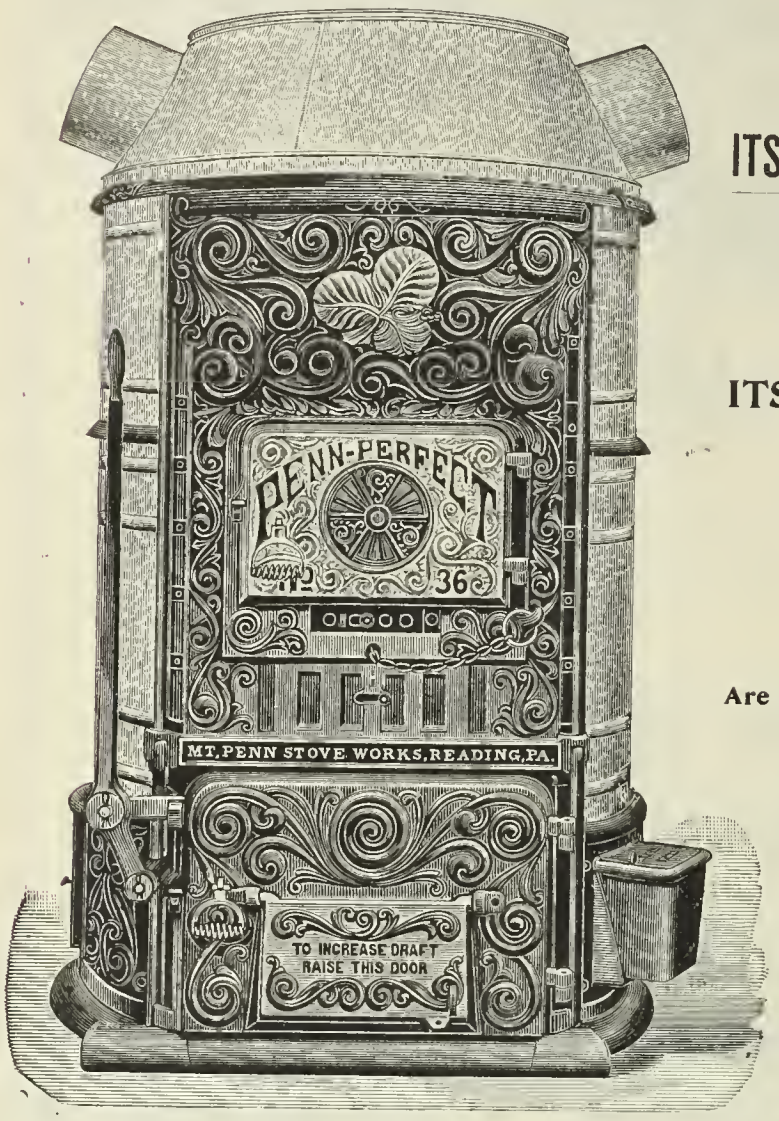

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ITS Massive Ornamental Front,
Perfect Grate, Large Ash Pit,
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Large Vapor Pan
Are Special Features which make the Furnace particularly attractive to a customer.

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It Burns Any Kind of Fuel.

The phenomenal success attending its introduction early last year, and the lively demand it has met since it was introduced, prove conclusively that it is

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IT IS MADE IN SIX SIZES.

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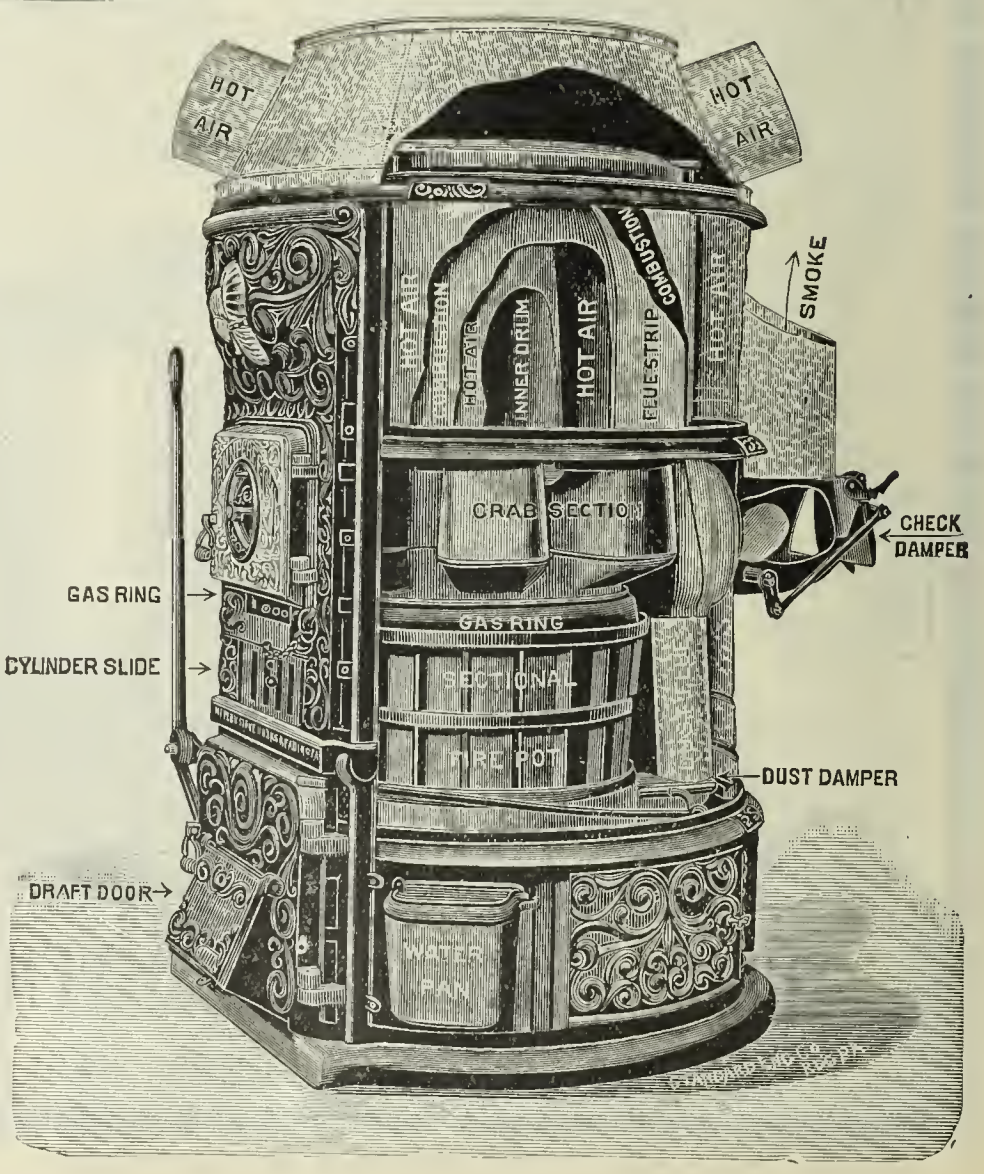

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When you want a good furnace don't forget the CELEBRATED BOOMER.

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SERIES 3.

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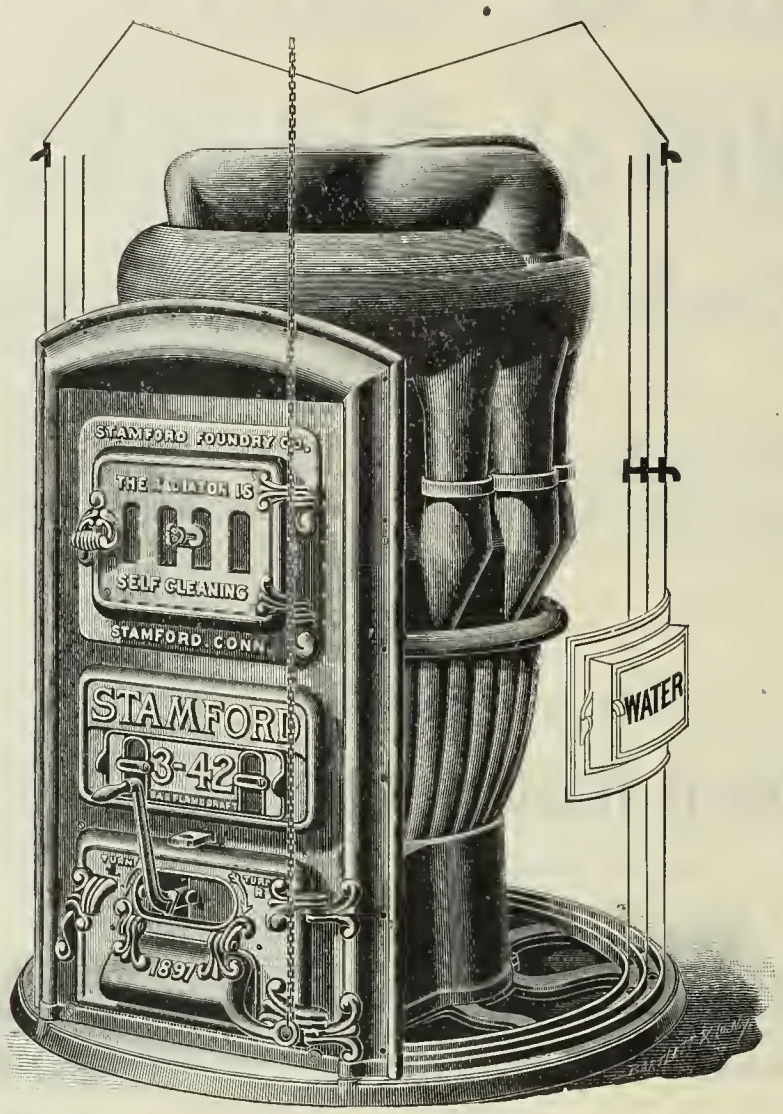

A modern warm-air furnace of the highest grade, with an unusually large amount of heating surface. Made with or without hot-water attachment.

The gas-flame flue brings fresh air through front of furnace and introduces it, well heated, immediately over the fire-pot, where it mingles with the gas from the coal and enables it to burn. Most of this gas would otherwise go unburned up the chimney. The quantity of air admitted is easily regulated by slide at front of furnace.

Side view of furnace with hot-water attachment will be shown next week.

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Send for catalog showing full line of Ranges, Stoves for various purposes, and Furnaces.

REPAIR RECORD

Of Over 600 Akron Air Blast Furnaces

SOLD IN OUR OWN HOME CITY AND COUNTY.

After seven winters' sales and use, less than 5 pounds of castings per furnace have placed **All Of 650 Akron Air Blast Furnaces** *that were sold and are now in constant use in Akron, O. (see our catalogue), in shape for another winter.*

AKRON, O., Nov. 24, 1897.
State of Ohio, Summit County, ss.

Willis Pettitt, bookkeeper for May & Fiebeger, being duly sworn, deposes and says:

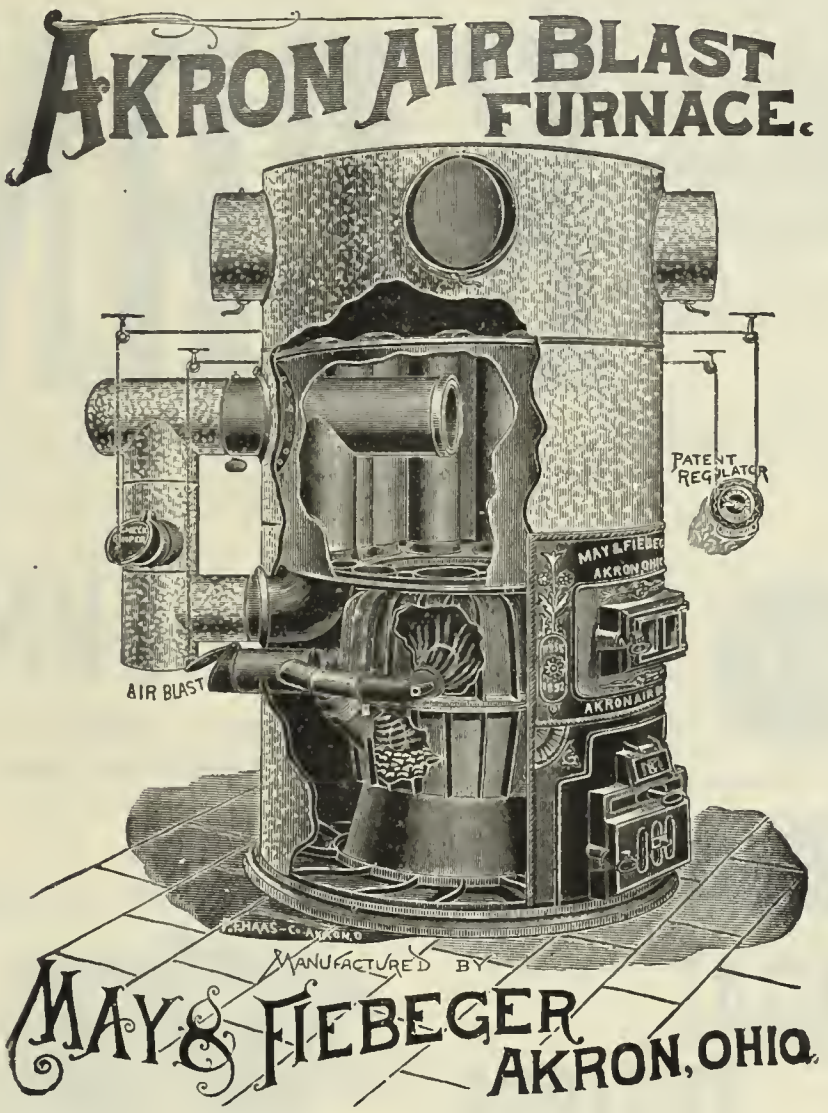
That from the 1st day of March 1897, to the 24th day of November, 1897, there were used in the repairing of all the "AKRON AIR BLAST FURNACES," numbering over six hundred, which have been sold in Akron and Summit County, Onio, during the past seven years, 9 fire pots, 12 grates, and total amount of all other castings, 828 pounds: and further this deponent saith not.

W. E. PETTITT.

Sworn to before me, and subscribed in my presence, by the said Willis Pettitt, this 24th day of November, A. D. 1897.

F. B. THEISS,
Notary Public.

A Splendid Record is Shown by the Above Statement.



It will be of interest to the Hundreds of Agents of the Akron Air Blast Furnace and the Thousands of their Patrons and customers to know the durability of the Akron Air Blast Furnace. With this in view, we have had our bookkeeper, Mr. Willis Pettitt, take the exact amount of all repairs used this season on all Akron Air Blast Furnaces which have been sold and used here in Akron and Summit County during the past seven years of their manufacture. About 90 Akron Air Blast Furnaces have been sold each year from and including 1890. **These 90 first furnaces have had seven winters' use up to May 1st, 1897.** About 90 more have had six winters' use; 90 more have each been used 5–4–3–2 and 1 winter, making a total of over 600 furnaces that have been used from 1 to 7 winters. How many castings were needed to put all of these furnaces in proper shape for this coming winter? From March 1st, 1897, until the present day, Nov. 24, 1897, there have been used to repair all (over 600) Akron Air Blast Furnaces sold in Akron and Summit County, **12 grates, 9 fire pots, all other castings, 828 pounds.** When the fact is taken into consideration that this number includes every pound of casting needed, whether the furnace has been fairly or unfairly used whether the directions were followed or not, this record is wonderful, especially when 85% of these furnaces were used all these years with soft coal as fuel.

Where the construction of a furnace is cheapened in order to effect sales, it adds greatly to the cost of fuel and durability.

THE AKRON AIR BLAST PAYS FOR ITSELF IN FUEL AND REPAIRS SAVED.

One pail of coal in the Akron Air Blast Furnace produces as much heat as 1½ pails in cheaper construction furnaces. Hence the durability and wonderful results in record of our furnace. Send for our Catalogue.

MAY & FIEBEGER, MANUFACTURERS, **AKRON, O., U. S. A.**

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FOR

HARD COAL. SOFT COAL. NATURAL GAS.

CASINGS: 28 to 62 Inches.

FIRE POTS: 16 to 32 Inches.

The most complete assortment ever offered a dealer.

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Well Mounted.

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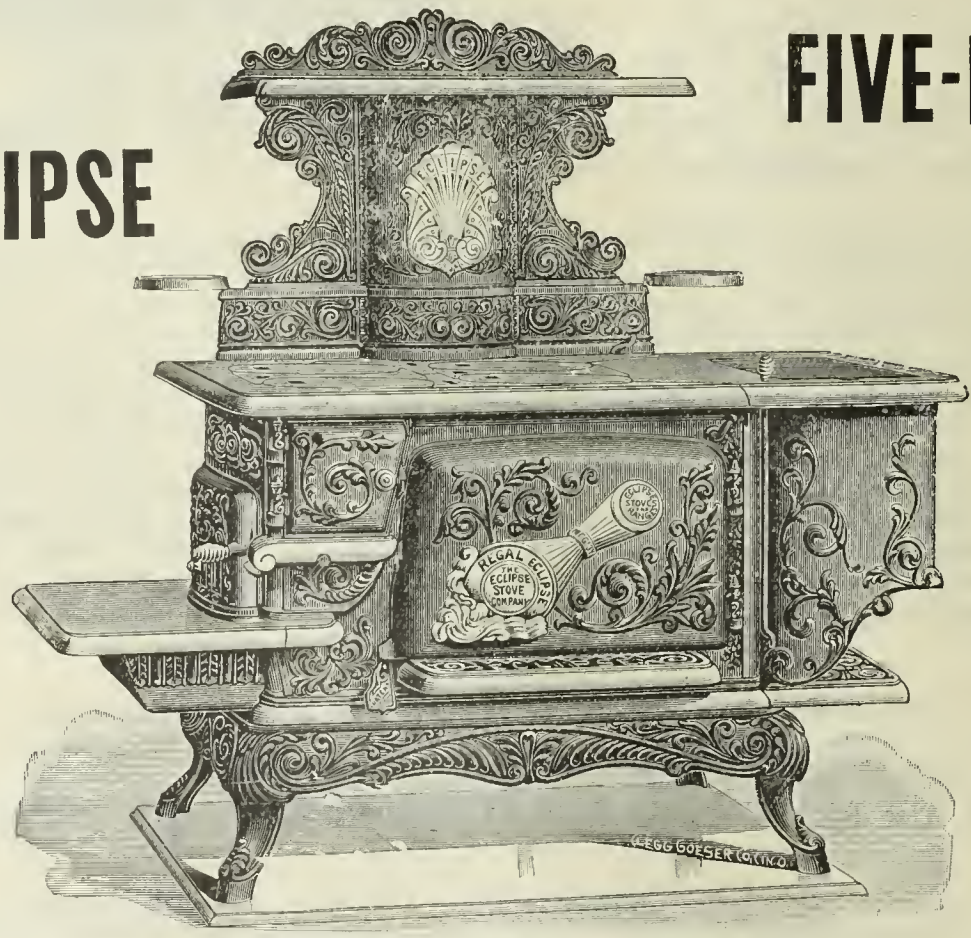

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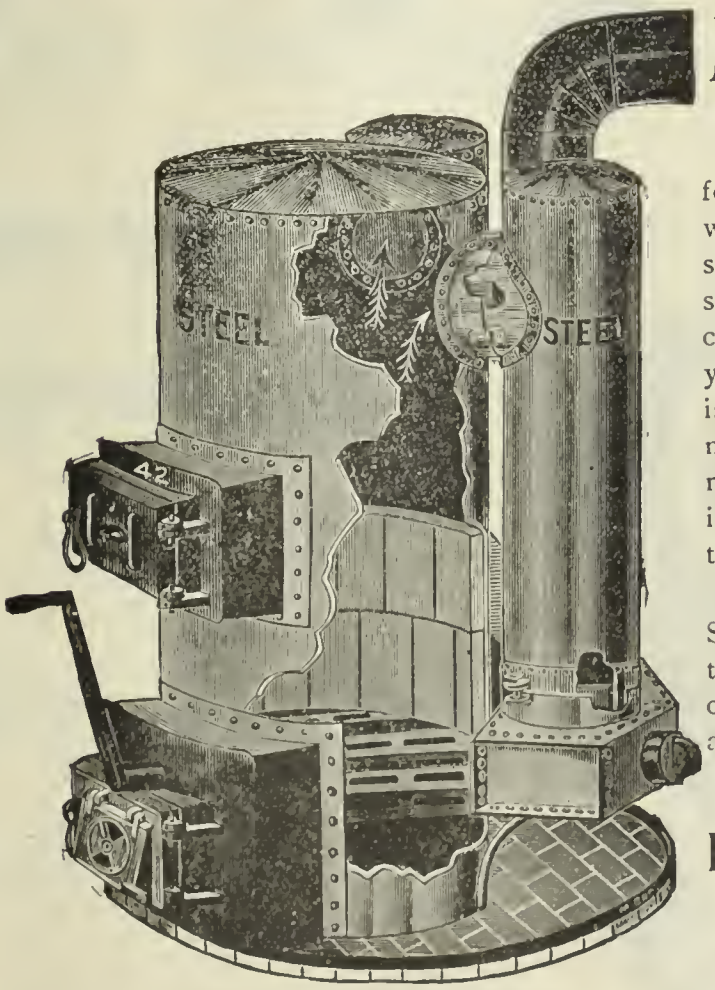

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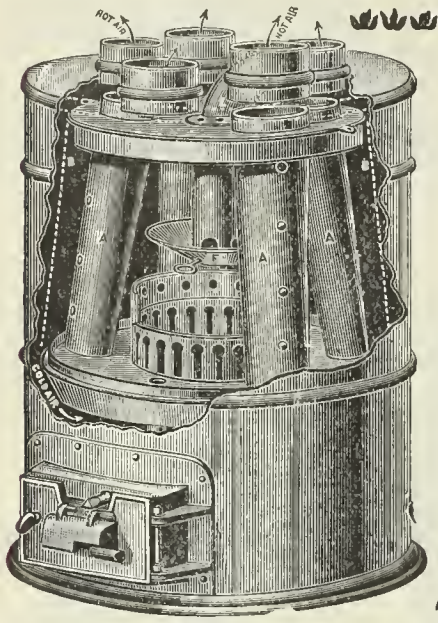

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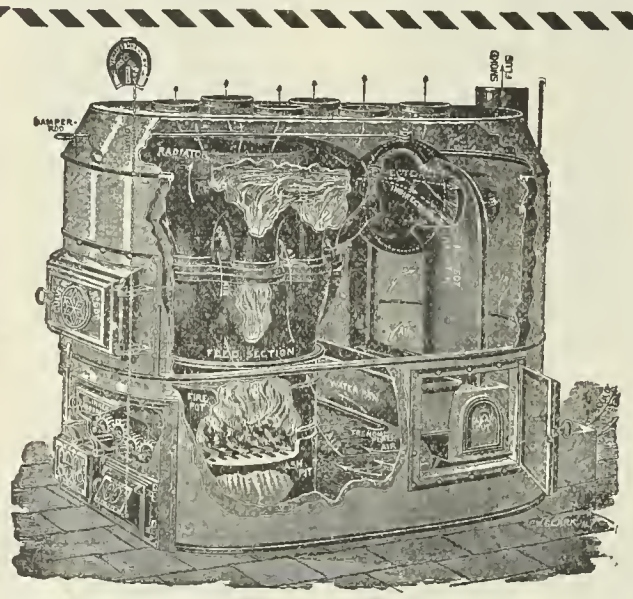

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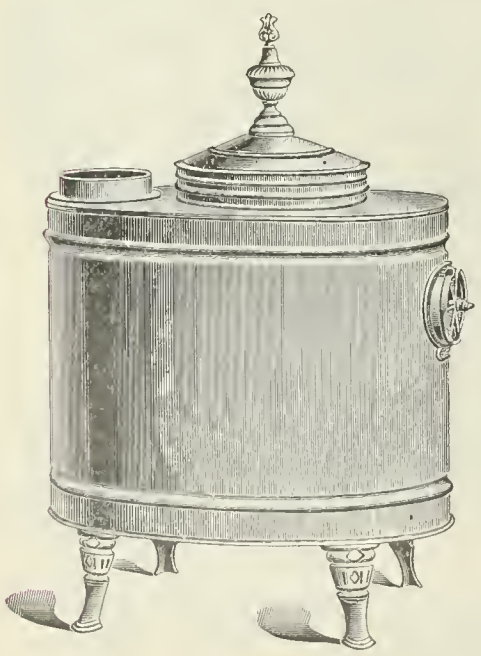

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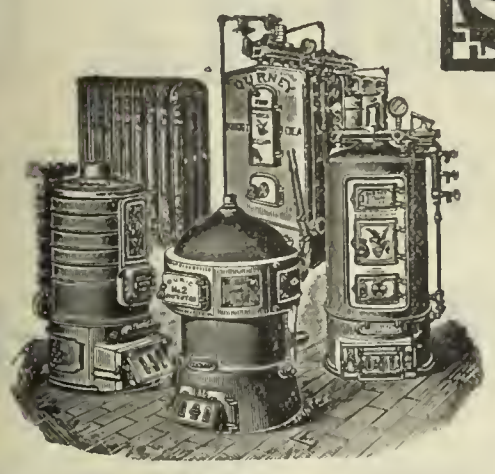

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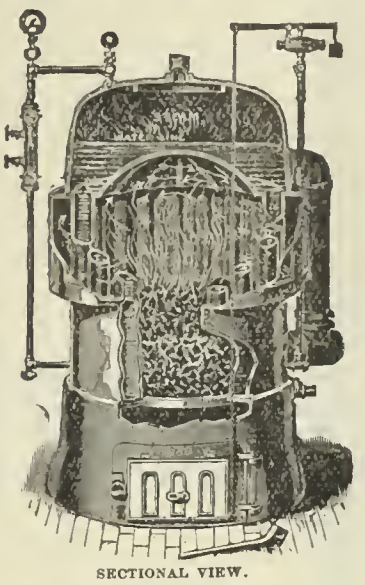


SECTIONAL VIEW.
DORIC SEAMLESS TUBULAR STEAM BOILER.

BRICK SET "Plummer" STEAM HEATER "New Model."

A powerful and economical heater that has stood the test as a practical house warmer for 12 years.

MADE IN OUR OWN FOUNDRY AND MACHINE SHOP.

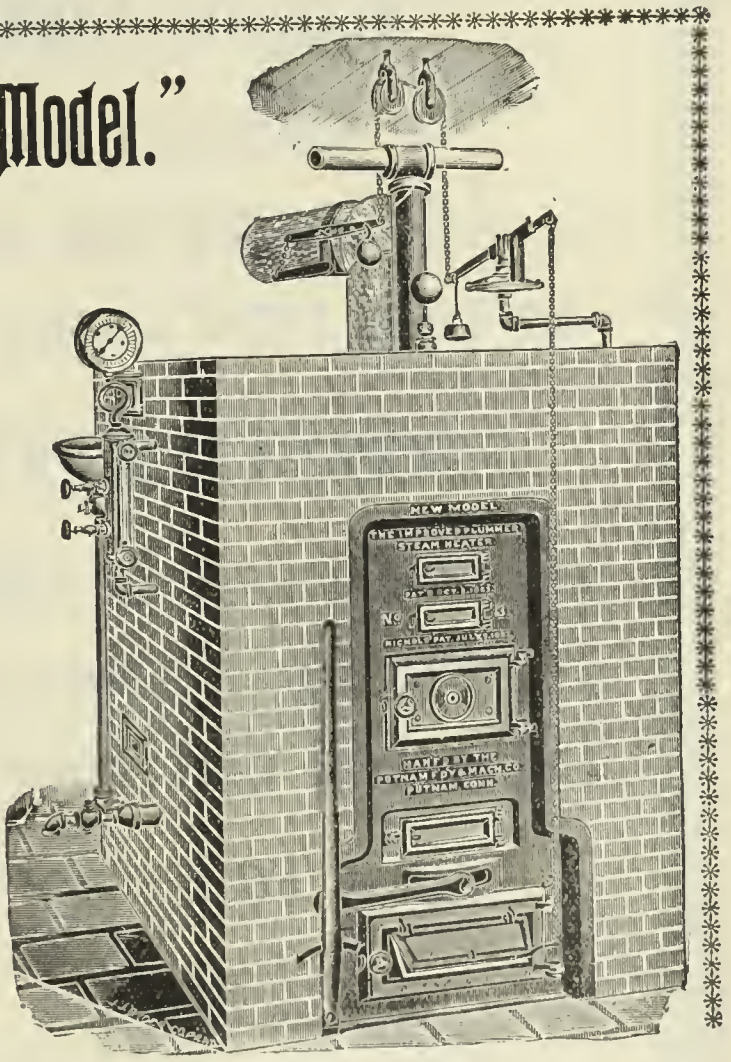
Send for Prices and Territory.

The Putnam Foundry and Machine Co.

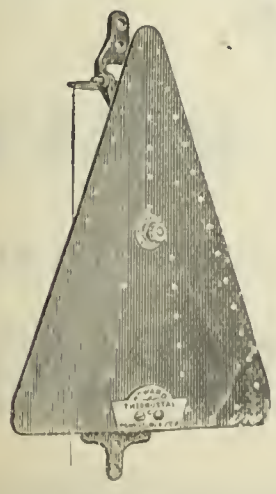
PUTNAM, CONN.

MANUFACTURERS OF

Plummer Steam Heater, Leader Hot Water Heater,
Plummer Sectional Boiler, Nutmeg State Furnace.


NEW MODEL
THE NEW STYLE PLUMMER STEAM HEATER
No. 3
NICKEL PLATED TRIMMINGS
MANUFACTURED BY THE PUTNAM FOUNDRY & MACH. CO. PUTNAM, CONN.

The Thermostat



TO HEATER DAMPER OVER PULLEYS.

No Buttons To Push

ON THE

HOWARD

Automatic Draft Regulator

MADE BY

HOWARD THERMOSTAT CO.

N. Y. OFFICE— OSWEGO, N. Y. —210 WATER.

THE CYLINDER
DAMPER.

Regulates Furnaces, Steam or Hot Water Boilers.

No Electricity, Vapor, or Compressed Air. The Thermostatic plate in the living rooms operates directly upon the Cylinder Damper on the heater, by a connection over pulleys. Simplicity. Regulates itself.

JEWEL

WE HAVE

THE GRANDEST, SAFEST AND BE

Light a Match, Turn a W

Can be Lighted and in Full Operation

No gasolene used to start it—nothing

No gasolene can get out, even when va

to clog and cannot be filled when lighted.

ABSOLUTELY SAFE UNDER

as the tank is below the top and below th

Made in two sizes only, two burners a

structed entirely of sheet steel and brass

New in every detail and bound to be th

IT DEFIES

No stoves will be sent out until about

circulars will be ready until then.

BUT TAKE OUR WO

We Want an Agency in Every

GEORGE M. CLARK & COMPANY,

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T FOR 1898.

T GASOLENE STOVE EVER MADE.

el, the Stove Does the Rest.

1 30 Seconds Without Smoke or Smell.

t gas.

ves are all opened. It has no needle valves

ANY AND ALL CONDITIONS

valve outlets.

d step and three burners and step. Con=

cept the top.

best seller in America.

OMPETITION.

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own. Write Now and Secure it.

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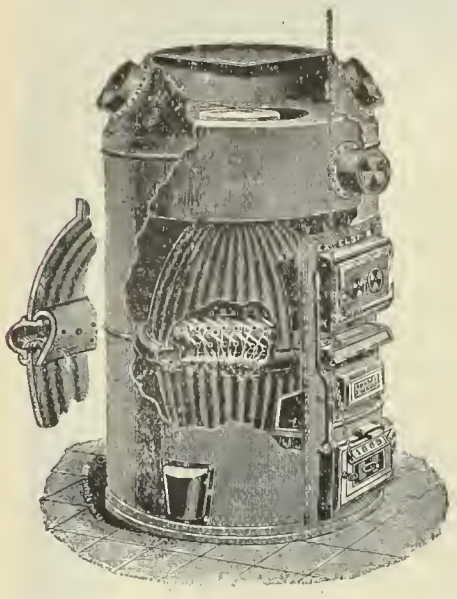


FURNACES
AND
FITTINGS.

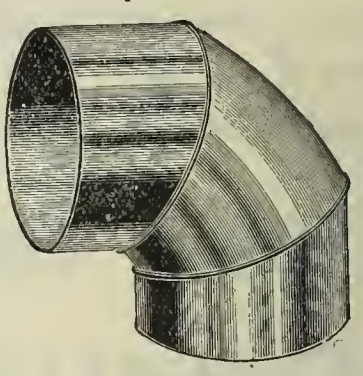
ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

THE EXCELSIOR STEEL FURNACE CO.,

38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.

You may miss a contract

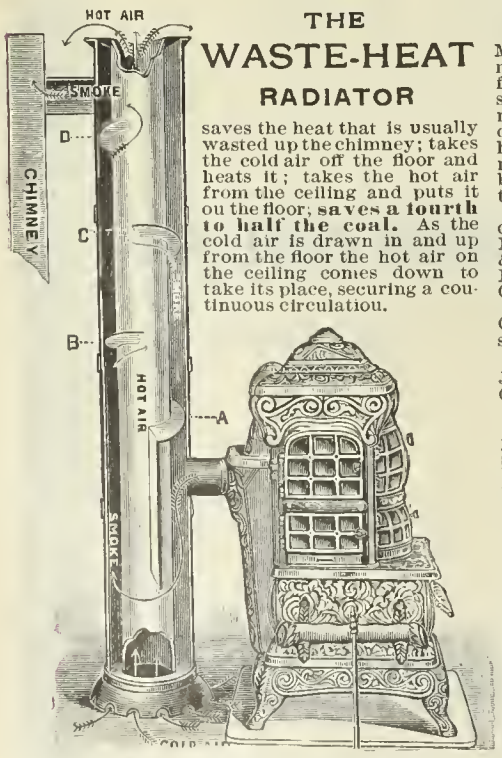
if you are not posted in regard to the merits of the Fowler & Wolfe Improved Wall and Steam-ship Radiator.

This is the Radiator which can be made any number of sections long, and in a variety of forms. It affords 3 ft. of efficient heating surface to 1 sq. ft. of wall surface, takes up very little more room than a base board, is exceedingly handsome in appearance, and may (the surrounding surfaces as well) be dusted with a feather duster. Is it any wonder that Architects and Heating Engineers are specifying it for use in the best contracts?

Drop us a postal and we will send you our illustrated catalogue.

FOWLER & WOLFE MFG. CO.,

664 BOURSE BUILDING, PHILADELPHIA.



The Waste-Heat Radiator Attached to a Stove.

THE
WASTE-HEAT
RADIATOR

saves the heat that is usually wasted up the chimney; takes the cold air off the floor and heats it; takes the hot air from the ceiling and puts it on the floor; **saves a fourth to half the coal.** As the cold air is drawn in and up from the floor the hot air on the ceiling comes down to take its place, securing a continuous circulation.

TO STOVE AND FURNACE DEALERS:

DEAR SIRS:—The Waste-Heat Radiators have been in use in Minnesota and other parts of the Northwest, where the thermometer often registers thirty to forty degrees below zero, for the past three years and have been thoroughly tested, so they are no experiment; but until within the past few months, they have been made only in a limited way, as each one had to be made to order owing to the difference in the height of the collars on different stoves and furnaces, but now we can make them with sliding collars and that they can be adjusted to fit any stove or furnace, therefore can make them in large quantities and do a general business in them.

The following people have used them during the past two or more years, to any of whom we refer: W. W. Rand, Sec'y Minneapolis Gas Light Co., Minneapolis, Minn.; J. C. Oswald & Co., Minneapolis, Minn.; Wm. Cunningham, St. Paul, Minn.; R. A. Lanpher & Co., St. Paul, Minn.; M. M. Gasser Co., Duluth, Minn.; W. W. Schiffman, Duluth, Minn.

The letter printed herewith from Mr. Clifford Hubbell, Cashier of the Columbia National Bank, Buffalo, N. Y., speaks for itself.

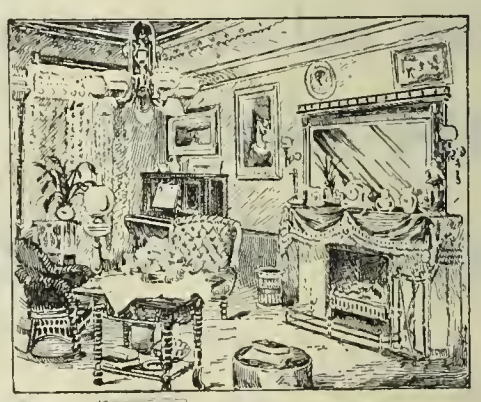
COLUMBIA NATIONAL BANK OF BUFFALO.
JOSIAH JEWETT, President.
CLIFFORD HUBBELL, Cashier.

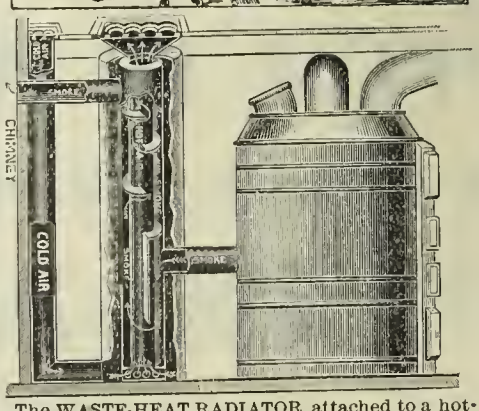
BUFFALO, N. Y.

DEAR SIRS:—Regarding the Waste-Heat Radiator which you placed in my residence, No. 71 Highland Ave., I have to say that it has worked admirably. I believe that the furnace burns 25% less coal now than formerly, and I think that that percentage is a very low estimate. In my mind the greatest advantage is that it draws the cold air from that part of the house where the cold air most accumulates, and makes the temperature in the rooms much more even, conducing thereby to comfort and healthfulness. I know that my wife, being skeptical about patent inventions of any kind, before this was put in, has come to acknowledge that this accomplishes the purposes for which it was purchased: viz., to save a large portion of the waste heat that goes up the chimney, and to save in the amount of coal burned, and make the temperature more even.

Yours respectfully,
CLIFFORD HUBBELL, Cashier.

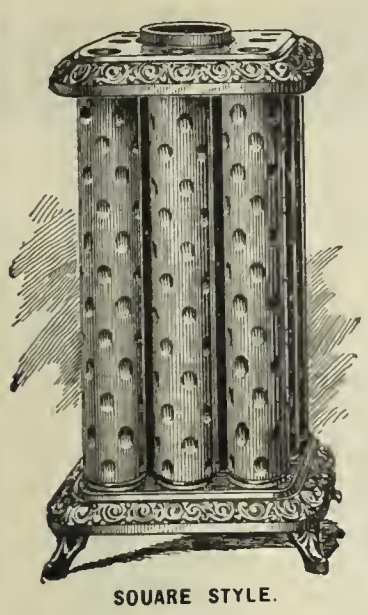
In order to introduce our Radiators we will send one to any reliable Stove or Furnace Dealer and if he finds it as we represent it then we want him to buy it and take the exclusive sale of them in his city; otherwise to hold it subject to our order. Yours truly,





The WASTE-HEAT RADIATOR attached to a hot-air furnace; attaches to steam and hot-water boilers in the same way.

WASTE-HEAT RADIATOR CO., BUFFALO, N. Y. (Eastern Depot.)
T. H. GREEN & CO., DULUTH, MINN. (Western Depot.)



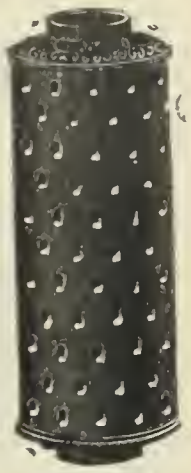
SOUARE STYLE.

DO YOU WANT TO INCREASE YOUR BUSINESS?

You can do so. There is no question about it at all. An article that will make one fire do the service of two fires finds many buyers as soon as people know about it.

New Era Radiators

do this, and there is a big profit on every one you sell. Drop us a card and we will send you a circular telling all about these Radiators and our special inducements for handling them. Do it now, so as to be ready for the opening of the season.



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Richmond RANGES

THE DEALER

Wishing to Supply only the Best should Acquaint Himself with

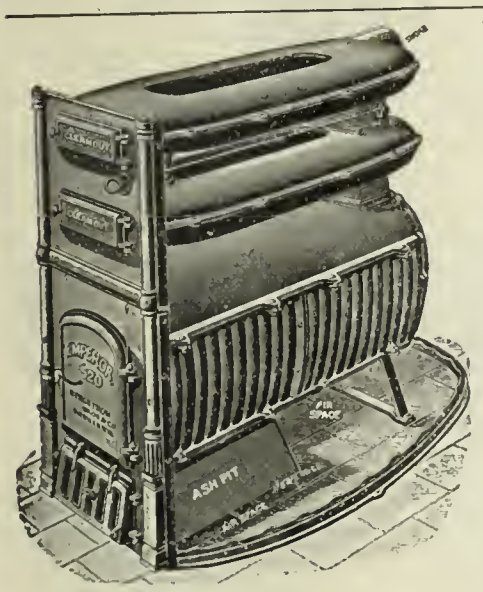
THESE PRODUCTIONS.

ECONOMICAL,
DURABLE AND EFFICIENT.

A REPUTATION OF THIRTY YEARS.

Richmond FURNACES

RICHMOND STOVE CO., NORWICH, CT.



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FOR WOOD.

Simple, Safe. Durable.

ECONOMICAL IN FUEL.

The Best and Cheapest Line of Wood Furnaces.

Furnished for either Brick or Galvanized iron Casing.

SEND FOR CATALOGUE.

Bergstrom Bros Co.

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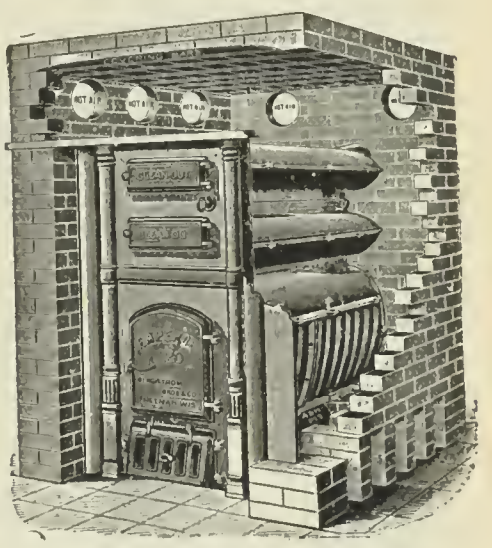
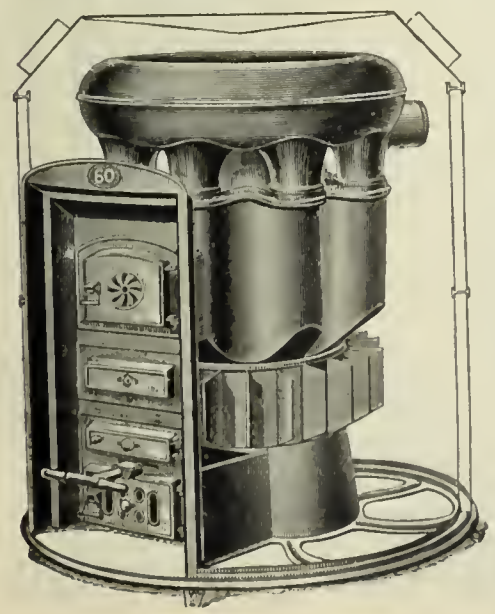




CORY'S Gas-Tight Single Section Heaters.

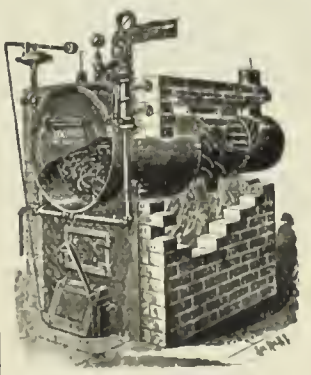
Large Surfaces—all good. No "*Steel*" or "*Sheet Iron*" to rust out.

ONE QUALITY ONLY.

All Cast Iron—No Bolted Joints.
Twenty Sizes—Portable and Masonry.

UZAL CORY & CO.,
210 Water Street, New York.

Established 1847.



Heating Engineers with an experience of over 20 years.

Vance Patent Boiler

FOR STEAM and HOT WATER HEATING

for Public and Private Buildings and Greenhouses. Adapted to burn hard or soft coal.

The Vance Steam Boiler Works,

446 Lake Ave., Geneva, N. Y.

—"I HAVE an account of a big landslide," said the new reporter. "What head shall I put it under?" "Put it under the 'Real Estate Transfers,'" said the snake editor.—*Exchange.*

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

Steam, Hot Water and Hot Air.

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in *The Metal Worker* and a chapter on Proportioning Radiating Surfaces.

"The various subjects treated on are indicated by marginal sub-headings for reference purposes, and the illustrations, computations, &c., are plain and easy of understanding. The book may truthfully be said to be a careful compilation of the best ideas of those best qualified to speak on the subjects treated of, and to form as a whole the very latest and most valuable literature on a topic which is becoming more and more recognized as being of the first importance in the building and furnishing of healthful homes."—*The Building Trades Journal.*

"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. Per contra, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanitarian.*

"Practical men have contributed of their knowledge in such a way and in such a form as to make the subject interesting as well as highly instructive, and with copious tables and diagrams showing the various methods of piping, &c., the work is unlike any book published. The book treats the subject in a common-sense method and goes directly to the point without any theorizing. It is a valued work and worth the money it costs many times over. It should be read by all devotees of the systems advocated in its pages, as it deals with a subject that is becoming more and more important every year, and one that demands the best thought and the highest skill of every workman."—*Register and Bulletin.*

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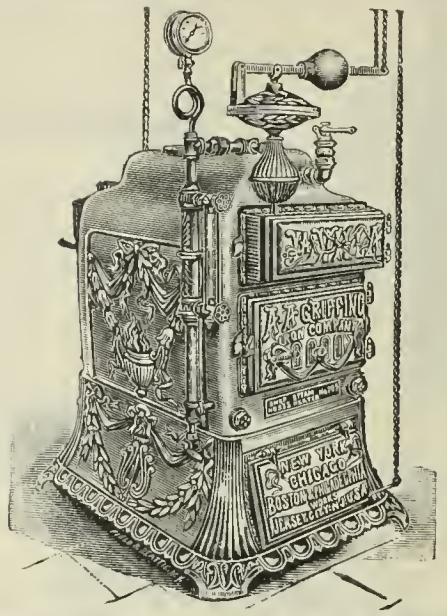

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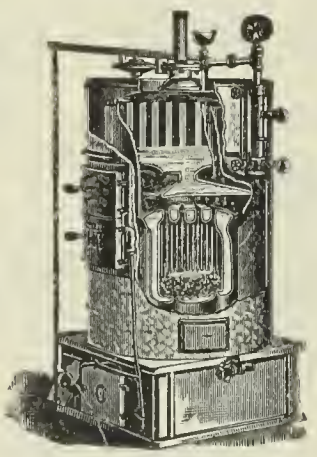

"Built to Heat."

SPEAKING OF MAN.

Even the "new woman" admits he is "a good thing to have in the house."

SPEAKING OF BOILERS,

The new and up-to-date Steam Fitter must admit that the

"PAGE"

is a "good thing" to have in ***any*** house. Users say so—***they ought to know.***

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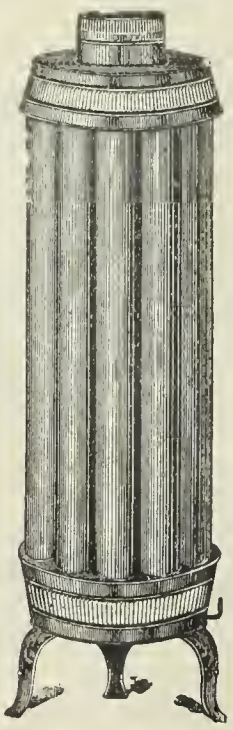
W. C. MOWRY, Lock Box 314, Norwich, Conn.

UP AND DOWN DRAFT RADIATOR.



The only Revertible Flue Radiator on the market. It produces twice the heat of any Direct Draft Radiator made.

YOU WILL MAKE FRIENDS, NEW CUSTOMERS AND MONEY BY SELLING THE BEST.

Write any of the following Jobbers. who will be pleased to send you a descriptive catalogue and prices:

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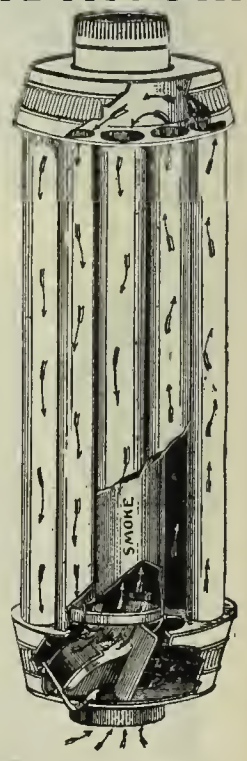

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The Mitchell Water Heater.

Has no Joints to Burn Out or Leak.
Heating Surface all in One Casting.
Water Passages all Vertical.
Largest Amount of Fire Surface

OUR 100 SERIES FOR STEAM OR HOT WATER.

Is constructed on the same general principle, but arranged to be used without jacket.

If you have competition and want to make a low estimate to secure the job, we can help you do it.

Write for . . . . Catalogue and Prices.

THE MITCHELL HEATER CO., 50-60 Pine St., POUGHKEEPSIE, N. Y.

—but why run any risk?

When you get a "Florida," a "Soleil," an "American," a "Modern" (for steam), a "Spence," a "Perfect," a "Tropic," an "Advance," or a "Little Giant," (for water), you KNOW what you're getting.

Heater—certainty.

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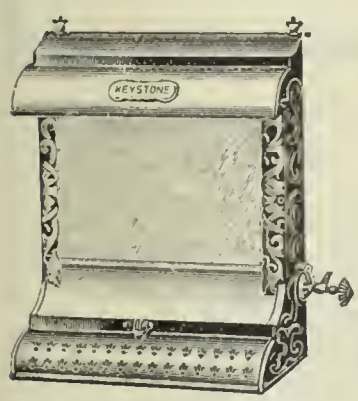

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Gas Stoves,
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Supplies for fuel and illuminating gas.

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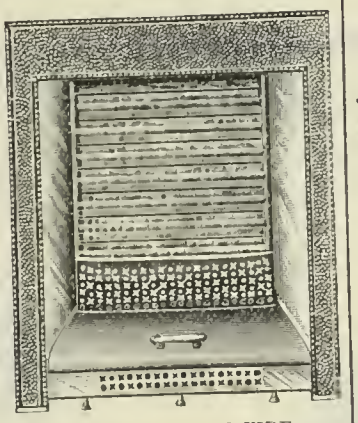

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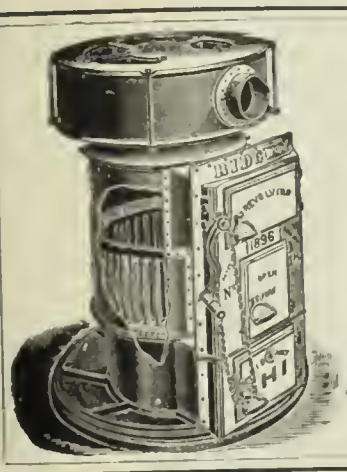

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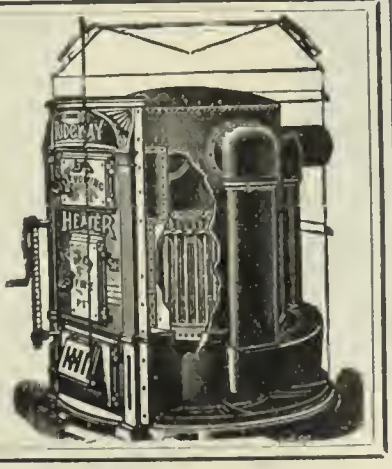

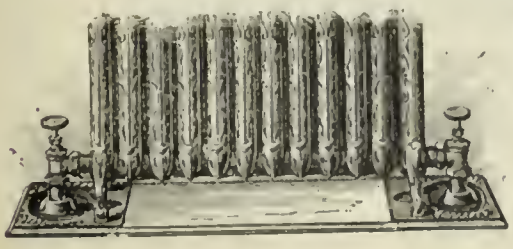

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A thoroughly practical device to finish under Radiators to assist steam fitter in making nice work.

Protects Floors, Carpets and Ceilings from Heat and Leakage.

Mfd. by GORMAN-ENGLISH CO.,
59 Northampton St., Wilkes-Barre, Pa.
U. S. AND CANADA PATENTS.

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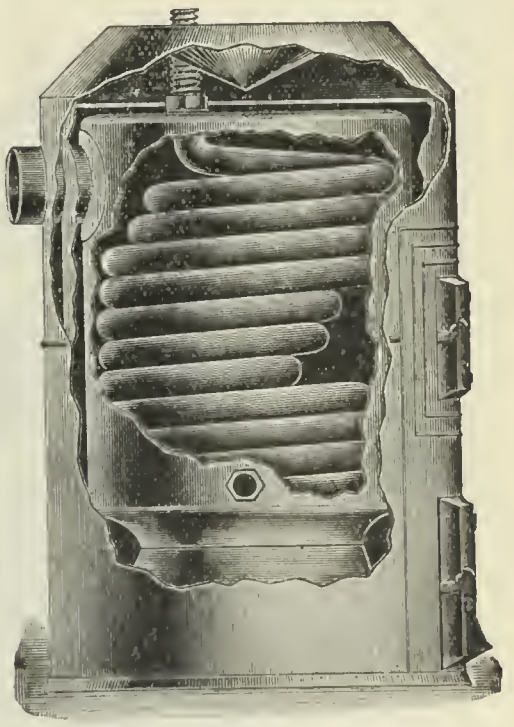

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HOUSES, STORES, CONSERVATORIES, and BATH ROOMS

by the combination of hot air and hot water if desired, or hot water alone.

The National Pipe Bending Co.,

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Break All Stove Records.

Less than 100 Stoves Sold 1892 and 3.

4100 Stoves Sold in 1894.

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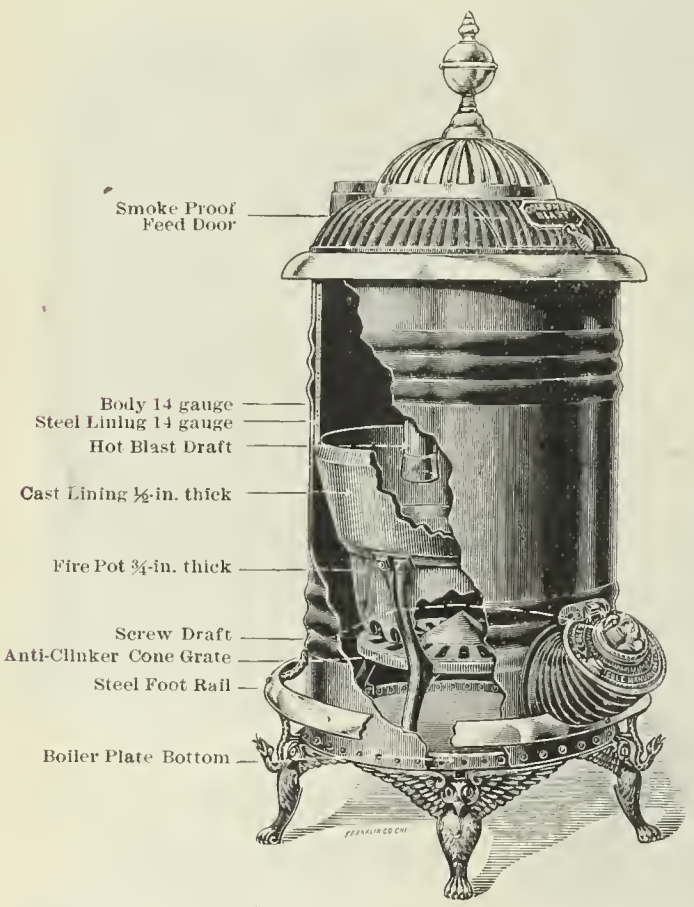
Four years ago sold less than 100 stoves, to-day sell ***One Twenty-fifth*** of the ***ENTIRE OUTPUT*** of three-quarters of a million Heating Stoves sold for 1897 in the ***United States.***

19781 Stoves Sold in 1896.

31415 Stoves Sold in 1897 up to Dec. 1st.

Cole's Air-Tight for Wood and ***Hot Blast for Coal*** are now known everywhere. This steady and phenomenal increase of sales during a panic period is due largely to the popularity and economy of our Hot Blast Coal Heaters.



Shows No. 200 Hot Blast for Coal.

WHY THEY SELL.

They hold fire to beat any stove made.

They economize fuel enough to pay for stove first year.

They are low in price—neat in finish.

Cole's Hot Blast burns the gas half of soft coal wasted in other stoves.

Cole's Air-Tight stays tight.

The all steel, low down, radiating surface, including base, makes a quick, powerful heater.

We guarantee a saving of one-third the fuel.

If you would control the best sellers during the next five years ***GET THE EXCLUSIVE AGENCY FOR YOUR TOWN*** from the following distributing agencies:

C. W. HACKETT HDW. CO., St. Paul, Minn.
LEE-CLARKE-ANDREESEN HDW. CO., Omaha, Neb.
RICHARDS & CONOVER HDW. CO., Kansas City, Mo.
HORTON, GILMORE, McWILLIAMS & CO., Chicago, Ill.
W. B. BELKNAP & CO., Louisville, Ky.
HOLBROOK, MERRILL & STETSON, San Francisco, Cal.
COLONIAL STOVE CO., Philadelphia, Pa.
THE GEO. TRITCH HDW. CO., Denver, Colo.
JENSEN, KING, BYRD CO., Spokane, Wash.
MISSOULA MERCANTILE CO., Missoula, Mont.
THE S. B. HUBBARD CO., Jacksonville, Fla.
JOHN GAUCHE'S SONS, New Orleans, La.
STEFFIAN-KRAKAUER HDW. CO., El Paso, Tex.
E. T. WRIGHT & CO., Hamilton, Ont., for Canada.

Council Bluffs, Ia. COLE MFG. CO. Chicago, Ill.

Such letters come to us right along:

MOBERLY, MO.,
Oct. 8th, 1897.

CHARTER OAK
STOVE CO.,
ST. LOUIS, MO.

GENTLEMEN:—In justice to you we are pleased to say that the **CHARTER OAK HARD COAL BASE BURNER** and **CHARTER OAK AIR TIGHT SOFT COAL HEATER** and the **GRAND CHARTER OAK COOK**, all just received, are the finest looking stoves ever placed on a floor in our city, and we are proud of the goods, and shall push them with all our energy.

Yours truly,
BRISTOW BROS.

CHARTER OAK AIR TIGHT SURFACE BURNER.

The Grand Charter Oak

Is made in **Stove and Range** form, **with and without Reservoir,** for **all kinds of fuel** and in various sizes. The most artistic and best constructed line on the market.

GRAND
CHARTER
OAK
STOVE
LEADS
ALL OTHERS

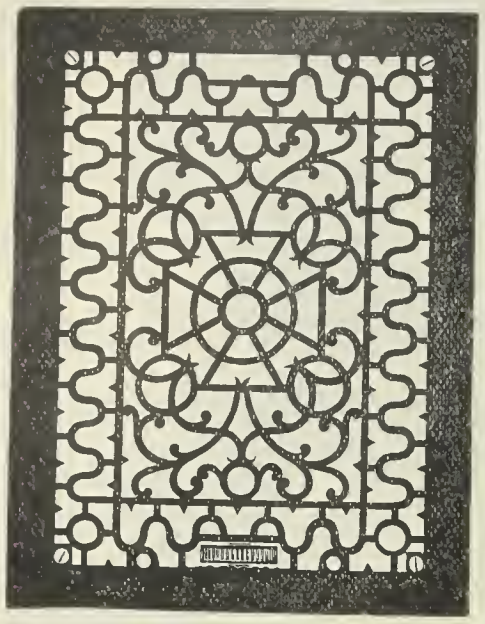
For nearly half a century the CHARTER OAK STOVES and RANGES have kept faith with their users, and are keeping faith to-day. Prices reasonable. Send for catalogue.

Charter Oak Stove & Range Co.

ST. LOUIS.

REGISTERS and VENTILATORS.

Send for our 1897 Catalogue.



"MALTESE PATTERN."

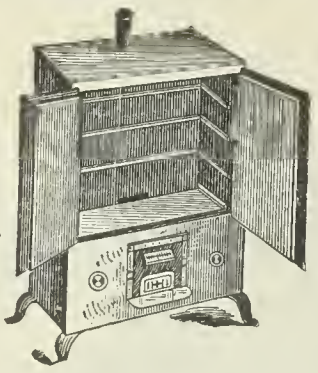
WM. HIGHTON & SONS,

NASHUA, N. H.

BLODGETT'S PATENT PORTABLE OVEN

FOR

Hotels,
Steamships,
Confectioners,
Public Institutions, &c
Core Baking,
Bluing,
Hardening Rubber Goods,
Bronzing,
Hardware Specialties, &c.



The only Oven Baking by Perfect Circulation of Hot Air.

Made in ten sizes. Send for Catalogue.

—— ALSO ——

Bicycle Enameling Ovens.

THE G. S. BLODGETT CO., Mfrs.

BURLINGTON, VERMONT.

See the New

Somerset Pallas Range.

It is the finest Range on the market.

ALSO

The Somerset Grand Parlor.

Send for Catalogue.

Somerset Stove Foundry Co., Somerset, Mass.

Established, 1827.

W JACKSON'S SONS,

Manufacturers and Importers of

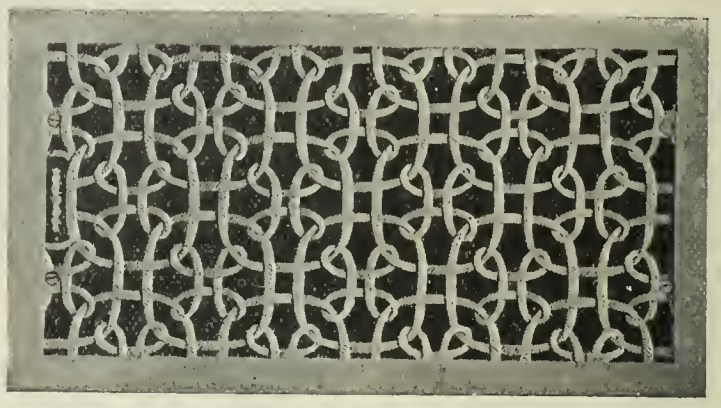
Grates, Open Fire Places Fenders, Fire Irons, Andirons, Tiles, &c.

Office and showroom, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

TUTTLE & BAILEY MFG. CO.,

NEW YORK, CHICAGO AND BOSTON.

Registers and Ventilators.



A ?.

Where can WESTERN BUYERS of HOT AIR REGISTERS send their orders and secure

Prompt Shipments, Low Freight Rates, Standard Sizes, The Best Finished Goods, The Lowest Prices?

THE ANSWER.

To the Largest Western Makers,

THE SCHREIBER & CONCHAR MFG. CO.,

DUBUQUE, IOWA,

Who carry in stock Black and White Japanned, Nickel, Brass, Bronze, Copper, and Antique Copper Finishes.

Send for Catalogue. Write for Prices.

If you write you saw "ad." in THE METAL WORKER, we will allow 1 per cent. extra discount on first order.

Cottage Boiler.

THE H. B. SMITH CO.,

Manufacturers of STEAM AND WATER

Heating ❋ Apparatus,

FOR PUBLIC AND PRIVATE RESIDENCES.

SPECIALTIES:

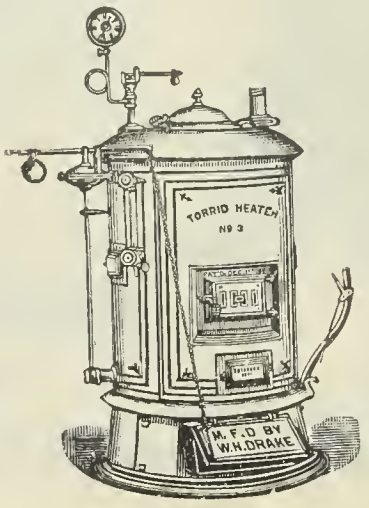
RADIATORS: Union, Royal Union, Champion, Imperial.
BOILERS: Mercer, Gold, Cottage, Mills.

ADAPTED FOR STEAM OR WATER.

Salesroom: 133-135 Centre St., N. Y.
Send for Circular. Foundry, Westfield, Mass.

"TORRID" HEATER.

FOR STEAM OR HOT WATER.



IT IS PRACTICAL IN DESIGN.
IT IS SAFE, BEING TESTED TO 200 POUNDS.
IT IS EASY TO MANAGE AND KEEP CLEAN.
IT IS DURABLE.
IT IS SECTIONAL AND EASILY HANDLED.
IT HAS NO PACKED JOINTS.
IT IS SELF-FEED OR SURFACE BURNING.
IT HAS THE TORRID PATENT ROCKING AND DUMPING GRATE.
IT IS LOW IN PRICE.

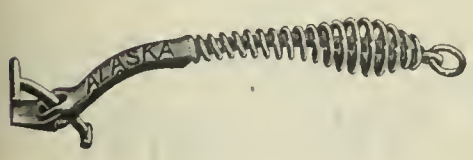
SEND FOR CATALOGUE.

MANUFACTURED BY

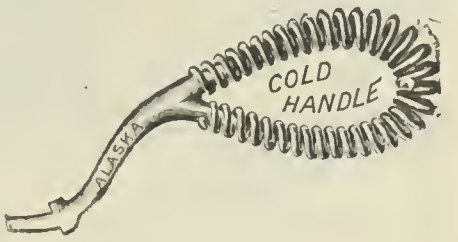
W. H. DRAKE No. 36 Clinton St., NEWARK, N. J.

FACTORY: HACKETTSTOWN, N. J.

...ALASKA...

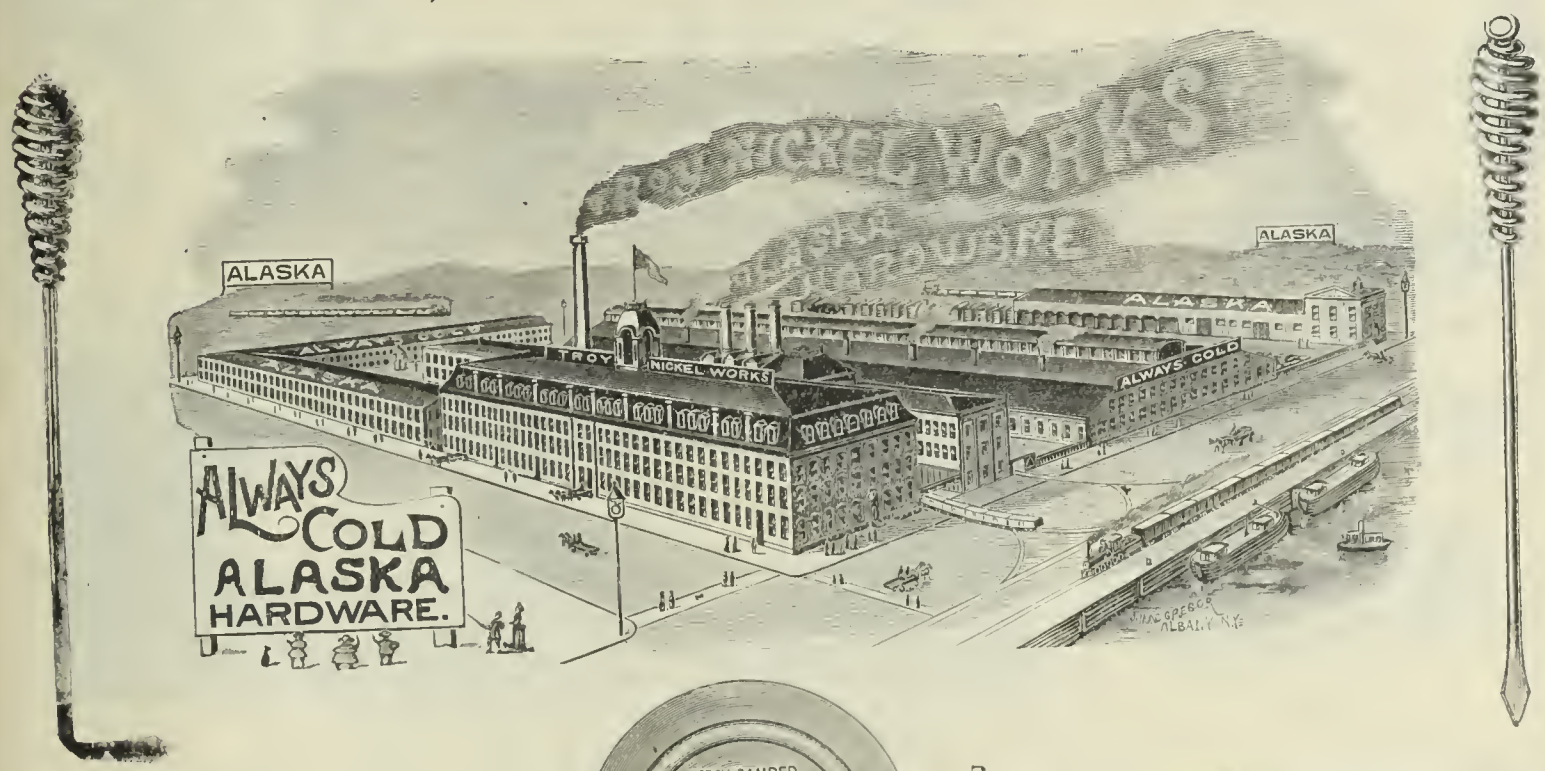


All good things are imitated.
Buy the original and
GET THE BEST.



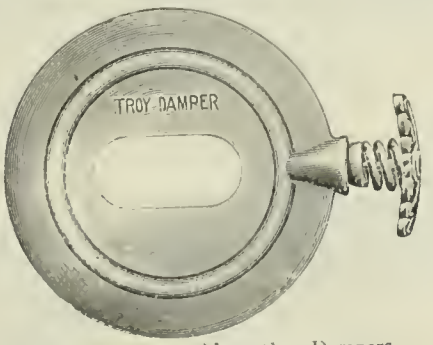
STOVE

Lid Lifters, Pokers, Shovels, Fire Sets.



PIPE

DAMPERS.



This is not as old as other Dampers, but it's getting there just the same, and re-orders proclaim the fact that it's liked by the users. Made in all sizes. "Handle Nickel Plated."

KNOBS.

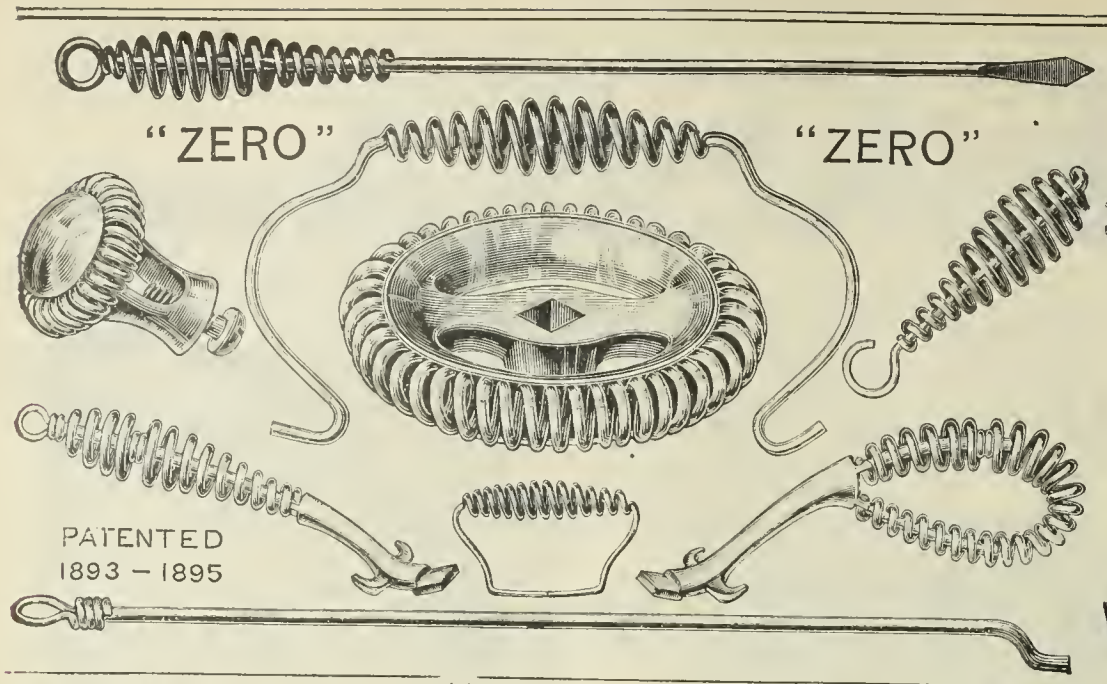
TOWEL RODS.

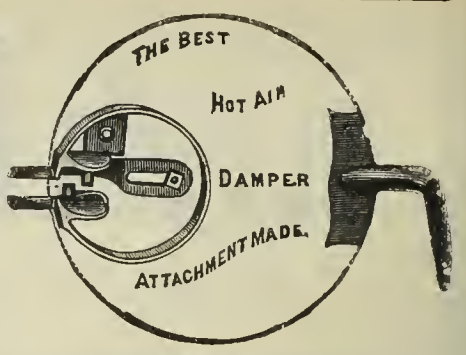
N. B.—Having bought the entire line of Patterns of Perry Stove Co., we are in position to furnish *ALL REPAIRS* for this make of Stoves.

SEND ALL ORDERS TO US DIRECT.

TROY NICKEL WORKS,

ALBANY, N. Y.





"ZERO"

WIRE GOODS.

Manufactured By

W. F. GREENE,

TROY, N. Y.

American

WAFFLE IRONS.

The Best for Gas or Gasoline Stoves. Easy to Clean. Long Wood Handles.

Buy no other.

"ERIE" HOLLOW WARE

ALSO COMPLETE ASSORTMENT OF

Full Nickel Plated Ware,

UNSURPAS ED IN FINISH.

"ERIE" ALUMINUM CAST WARE.

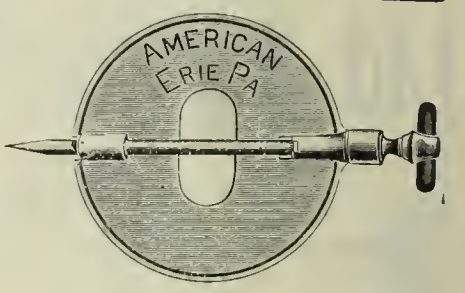
The finest ware ever made. It will pay you to handle it.

New Goods for Spring Trade. Send for New Catalogue.

Try our Improved Double Broiler for Gas or Gasoline Stoves.

GRISWOLD MFG. CO., Erie, Pa.

New York Warerooms, 294 Pearl Street.



American Dampers and Clips are the Best

in every particular. Wood or Nickel Handle. Write for prices, and

BUY ONLY THE AMERICAN.

Stove Dealers!

ASK

THE

Manufacturer

to line your stoves with the **BEST LININGS.** A set of our linings in a stove greatly enhances its value.

Newton & Co.,

Albany, N. Y.

THE GEORGE W. COPE

Stove Pattern Works

Original, Artistic and Practical Construction

Cor. Randolph and Atwater Sts.,

DETROIT, MICH.

M. D. VALENTINE & BRO. CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBRIDGE, N. J.

The FOREST CITY FOUNDRY AND MFG. CO.

LIGHT GRAY CASTINGS A SPECIALTY.

WINSLOW, SYCAMORE, ELM & MAIN STS.

Our Specialty is Fine Stove and Range Castings. Pattern Castings Made, Filed and Fitted.

Cleveland, O.

KEEP YOUR HANDS CLEAN.

THE PARKS STOVE POLISHING MITTEN AND DAUBER

Is a great improvement over the old stove brush for blacking stoves, **without getting a speck of blacking on hands.**

The front is soft, durable sheepskin, with the wool on. The back is waterproof cloth.

The Dauber is also made of sheepskin, with the wool on, and so shaped as to readily get the blacking into all crevices and corners. It is also adapted to polish russet and patent leather shoes, cleaning windows, furniture, etc.

MANUFACTURED BY

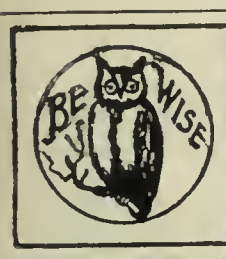
PARKS & PARKS, - Troy, N. Y.

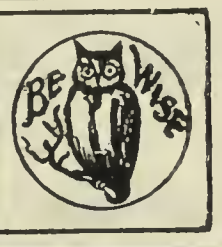
WHEN YOU NEED
STOVE LININGS
Try ☞
Will not Clinker.

FIRE STONE.

Presbrey
Stove Lining Co.,
Taunton, Mass.

MARCY STOVE REPAIR CO.,
MANUFACTURERS OF
Range, Stove & Heater Repairs
AND FIRE-BRICK LININGS,
74 Beekman Street, New York.
FOUNDRY, Perth Amboy, N. J.
FIRE-BRICK FACTORY, 36 to 46 South Fourth Street, Brooklyn, L. I.
BRANCH STORES:
South Fourth Street, Brooklyn, L. I. 362 Grove Street, Jersey City, N. J.
CATALOGUES NOW READY.

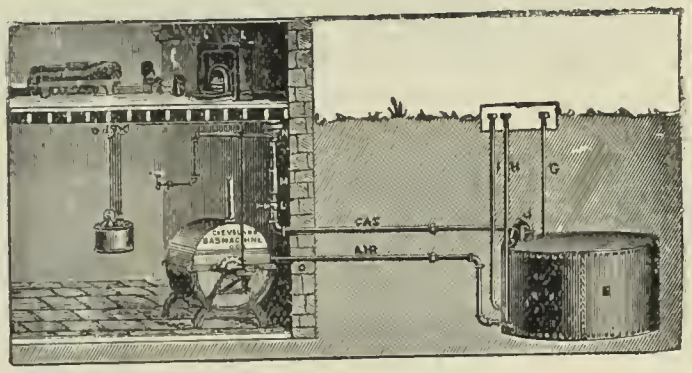


ORIGINAL
ARTISTIC
SALABLE
PATTERNS
GOBEILLE
CLEVELAND


MICA
EUGENE MUNSELL & CO.
MINERS & IMPORTERS.
NEW YORK. 218 WATER ST.
CHICAGO. 117 & 119 LAKE ST.

CLEVELAND GAS MACHINE CO.
82 Champlain St., Cleveland, Ohio.
Please send for **Reduced Price** List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting surburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engines.



ARTISTIC
PATTERNS
FOR
STOVES,
FURNACES,
HOT WATER &
STEAM HEATERS
VEDDER PATTERN WORKS
ROBERT GALBRAITH MECHANICAL EXPERT
TROY, N.Y.

"O. H." One Piece Stove Pipe Elbows.
SOLD BY ALL
Jobbers.
The Lawrence-Letts Elbow Co., Ltd.,
Sole Manufacturers,
WAVERLY, N.Y.

McLEOD & HENRY Co
FIRE BRICK
STOVE LININGS
TROY, N.Y.

RUSTY R. U.?
THE BAR-KEEPER'S FRIEND
TRY IT
IT WILL POLISH UP THE HANDLE OF YOUR FRONT DOOR, OR THE GOLD THAT'S BEEN LOCKED UP SO LONG, OR ANY OLD THING IN THE METAL LINE WITH A QUICK AND LASTING BRILLIANCY THAT WILL ASTONISH YOU.
WRITE GEO. W. HOFFMAN,
297 E. Washington St., Indpl's., Ind.
4 FREE SAMPLE.

MICA
ALL SIZES.

Look
At this Bargain Package for
$5.00
including Case.

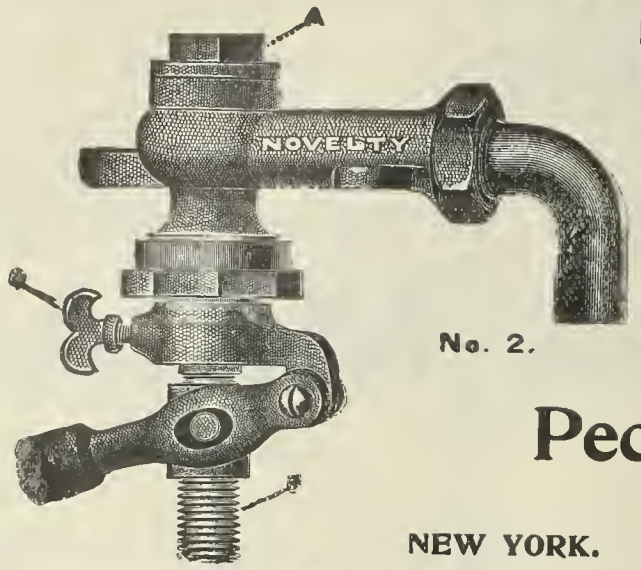
¼ pound	2	x 3½
¼ "	2½	x 2½
¼ "	3	x 4¼
¼ "	3½	x 5½
¼ "	4	x 7
¼ "	3	x 3¼
¼ "	2¾	x 4
¼ "	2½	x 4½

SENT POSTPAID UPON RECEIPT OF THE MONEY.

JOS. HUSE & SON,
Nos 95 & 97 Blackstone Street,
BOSTON.

MICA

PATTERNS
Made to order for STOVES, RANGES and FURNACES by
CINCINNATI PATTERN WORKS,
FRONT AND LAWRENCE, CINCINNATI, O.



No. 2.

The Novelty Ball Cock

(PATENTED).

Top Supply. Made also for Bottom Supply. Noiseless. For High or Low Pressure. Easily Repaired. Write for Prices.

MANUFACTURED ONLY BY

Peck Brothers & Co.,

NEW HAVEN, CONN.,

NEW YORK. BOSTON.

NOTHING SUCCEEDS LIKE SUCCESS,

hence the unqualified success others have experienced with the

CLIMAX CELLAR DRAINER

should induce you to use it also. Your customers need This Drainer, and you should write to-day for circular and prices, because it is the Plumber best qualified to do intelligently and satisfactorily all classes of work who meets with the greatest success and therefore the success of the

Climax Cellar Drainer

is your success also.

Years of effort have enabled us to produce a Drainer of marvelous perfection, entirely free from stuffing boxes, springs, packings and washers; a result not accomplished by any other manufacturer.

The simplicity, reliability and superiority of the **Climax Cellar Drainer** are proverbial.

Sold by all Jobbers.

MANUFACTURED BY

C. M. KEMP MFG. CO.

BALTIMORE.

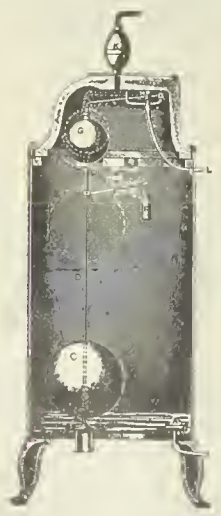
Leather and Rubber

WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.



Patented Dec. 4, 1894.
Patented Oct. 15, 1895.

THE

I. X. L. Automatic Beer Pump.

One month trial free.

Every Pump Guaranteed for One Year.

Muddy Water Does not affect it.

The simplest, the Most Reliable, and the Speediest Pump on the market.

Great *Saving* of *water rent* under meter system.—Will produce 15 pounds air pressure in a 20-gallon air receiver with one stroke of the pump. Send for price, testimonials, and descriptive circular.

THE I. X. L. BEER PUMP CO.

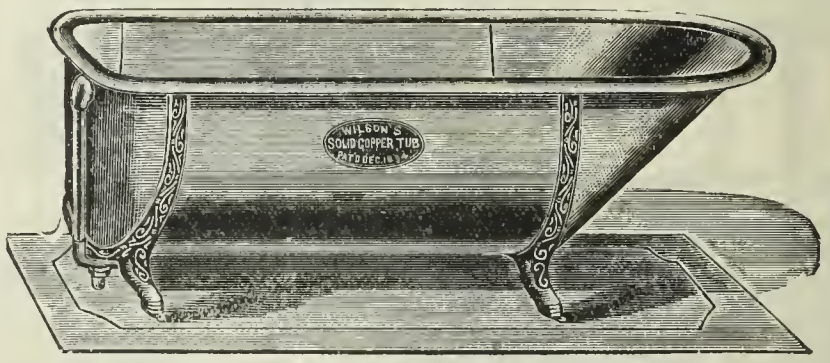
Sole Manufacturers,

1015 Christian St., PHILADELPHIA, PA.

TIME IS MONEY!

Therefore waste no more time in looking further when we have just what you want,

A Double Seamed Solid Copper Bath Tub,



THE MOST SANITARY TUB IN EXISTENCE.

The only one upon the market.

Send for illustrated Catalog of Bath Tubs, Tanks, Seats, Copper Range Boilers and Plumbers' Brass Work. Manufactured by

R. M. WILSON,

Rome, N. Y.

—THE—

KELLY SHOWER BATH RING

Patented April 30, 1895.

It Will Produce Better Results Than a $100 Shower Bath.

For particulars write

Thos. Kelly & Bros.

Manufacturers of Permanent Plumbing Goods

201 Madison St., CHICAGO.

New Style.

OUR PATENTED IMPROVED

Broughton Self-Closing Basin Cock.

No exposed working parts.

Every intelligent plumber will appreciate this.

The Broughton work has been in use many years.

Unsurpassed for strength and durability.

Every one warranted.

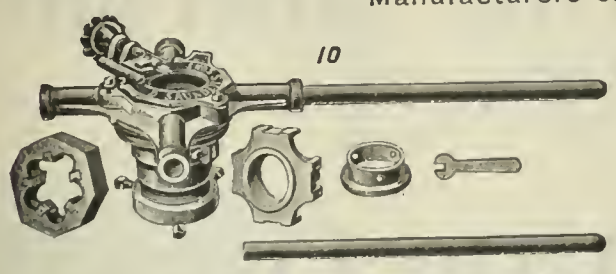
Write for Circular and Price-List.

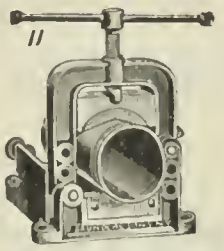
E. STEBBINS MFG. CO.,

Factory at Brightwood, SPRINGFIELD, MASS.

D. SAUNDERS' SONS,

Manufacturers of





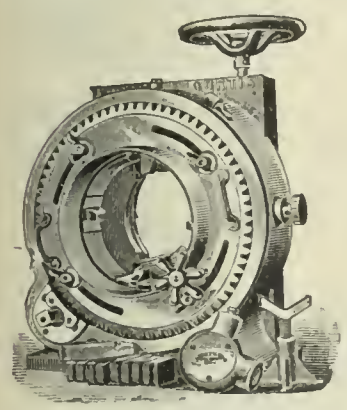
DIE-STOCKS AND VISES

FOR **LARGE PIPE.** These stocks have *CUTTING OFF ATTACHMENT*, and both Vises and Stocks are Malleable Iron. Light, strong and of superior design and finish; also *PIPE THREADING MACHINES* ¼" to 18", Tapping Machines, &c.

Send for Catalogue to

27 Atherton St., **YONKERS, N. Y.**

FORBES' PATENT DIE STOCK



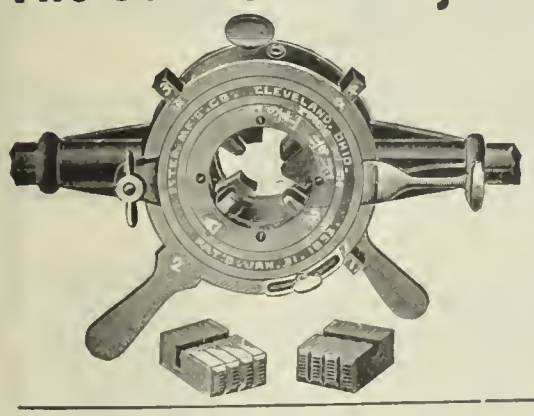
Ten inch pipe cut off and threaded by one man with ease.

Send for Illustrated Catalogue.

CURTIS & CURTIS,

56 Carden St., - Bridgeport, Conn.

The Oster patent Adjustable Stocks and Dies.



The latest Invention in Pipe and Bolt Threading Tools.

OPENING DIES MAKE AND PRESERVE PERFECT THREADS.

No others will.

They have correct construction; are made of the best material; are easy to operate. A fulcrum clamp Sets and holds the Dies as rigid as solid Dies. Adjustable Guides center the work to the Dies. They have no equal. Warranted in all respects.

We invite a trial.

THE OSTER MFG. CO.,
Cleveland, O., U. S. A.

Gem Gem Gem

GASOLINE
SOLDERING FURNACES.
UNEXCELLED, UNEQUALLED, UNRIVALLED,
FOR HEATING AND OPERATION.
No Smoke, No Odor, No Noise, Safe, Sure, Durable.
WRITE
BURGESS SOLDERING FURNACE CO.,
COLUMBUS O.

The Proof is in the Using

That "THE BOSTON" is the CHEAPEST PRACTICAL Cleanout on the market.

ABSOLUTELY WATER TIGHT

As it is made with Ground Joint, requiring no screws or washers.

READILY ADJUSTED.

Made with Heavy Iron Body, neatly Japanned, and Brass Cover. A Durable and Perfect Casting.

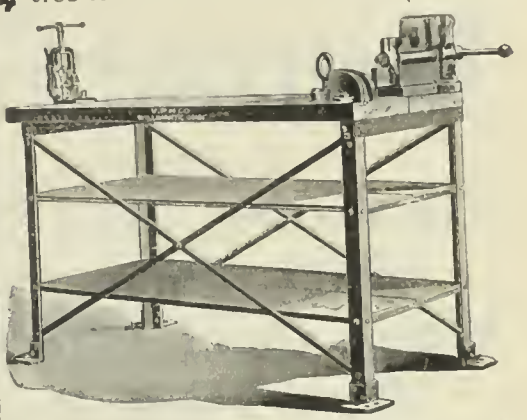
CRAWFORD & YOUNG, Manufacturers,

224 Franklin St., Boston.

Boston Cleanout—Cover off.

VANDERMAN'S 1897 Specialties.

Send us your address, and in return we will send you a catalogue of the best line of specialties in the United States,



Consisting of

Steel tool chests, steel frame portable work bench, pipe bending form, leak stopper, cast iron pipe cutter, lead pipe cutter, asbestos joint runner, combination vise for holding brass and nickel plated pipe, combination portable shower bath, bath tub seat without metal parts combination bench and pipe vise, malleable iron hinged vise with bending forms, lead pipe bender, plumbers' pocket estimate book and other specialties.

Manufactured and for sale by

THE VANDERMAN PLUMBING & HEATING CO.,
WILLIMANTIC, CONN.

The KENNEY System of WATER CLOSETS

Are used in the largest and finest office buildings in New York. Among them are

THE BOWLING GREEN BUILDING,
N. Y. PRODUCE EXCHANGE,
STANDARD OIL BUILDING.

The Kenney Sanitary Mfg. Co.,
47 Dey Street, New York.

COLWELL LEAD CO.

63 Centre Street, New York.

Manufacturers of

LEAD PIPE, SHEET LEAD, SHOT,

And Sellers of

Everything You Want for Plumbing.

—WHERE HE WAS AT.—Voice (from above stairs, to supposed butler)—Thomas, what are you doing at the sideboard this time of night?

Swipsey (the burglar)—At your service, mum.—*Harper's Bazar.*

—FREDERICK MILLER, a telegraph "messenger boy," of Branford, Conn., is eighty-seven years old, and can walk long distances. A message came addressed to a man in North Branford, the other day, five miles from the Branford office. Miller started out, and when he got to North Branford he found that the man lived in Northford. On he went, five miles more, found his man, delivered the message and started back, covering a distance of twenty miles, for which he received the sum of $1.

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23 and 25 Cliff Street, New York,

MANUFACTURERS OF

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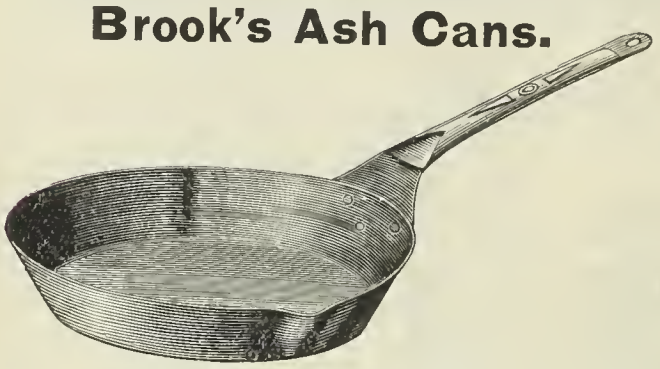
SPECIALTIES IN

Tin Wares, "Steel Edge" Dust Pans, Champion Flour Sieves, Central Watering Pots, Brook's Ash Cans.



Latest Style of Cold Handle Fry Pans.

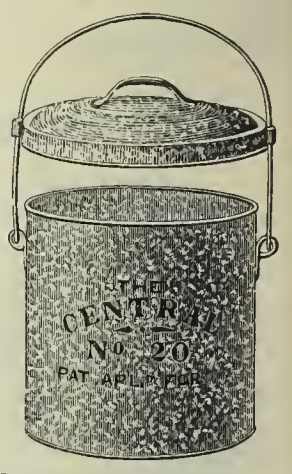
ARTICLES FOR

Kitchen, Farm, Dairy, Table, Factory, Lawn, Stable, Cafe.

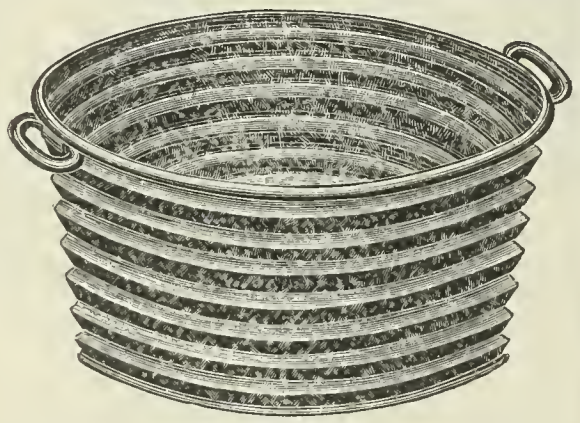
New Price List,
Send for Copy.

Proposals Invited.

LARGEST ASSORTMENT.
STANDARD GOODS.



New Ash and Garbage Can.
Cover Always Attached.



FOUR SIZES.

Number	0	1	2	3
Diameter at top, inches,	20⅝	21¼	23¼	24⅞
Diameter at bo tom, inches,	16½	18	19⅝	21
Capacity, quarts,	44	52	62	71

WRITE FOR PRICES.

S & B

Galvanized AND Corrugated WASH TUBS.

(PATENT APPLIED FOR.)

Strongest, Best AND Most Handsome Wash Tub Made.

NO BUCKLING OR BENDING.

CORRUGATED ON BOTH SIDES AND BOTTOM.
SIDES MAY BE USED AS A WASH BOARD.

MANUFACTURED SOLELY BY

KEEN & HAGERTY MFG. CO., - - BALTIMORE, MD.

"ENGRAVED"
"NICKEL" POTS.
ASSORTED DESIGNS.

W. H. SWEENEY MFG. CO.,

66, 68, 70 and 72 WATER ST., and 51 FRONT ST.,

BROOKLYN, N. Y.,

MANUFACTURERS OF

TIN, BRASS, COPPER AND NICKEL-PLATED WARE; TEA AND COFFEE POTS, TEA KETTLES, CUSPIDORES, TRAYS, &C.

These pots are richly engraved on copper and heavily nickel-plated. Have strong enameled wood handles and silver white finish inside.
Made in four sizes, tea and coffee.

Acknowledged to be the handsomest pots on the market.

Send for New Catalogue.

SEND US YOUR ORDERS FOR

LARD CANS

With Stamped Covers

Gallons	4	6	8	10
IC per Doz.	.....	.....	.....	....
IX per Doz.	.....	.....	.....	.....

WILL NEST AND PACK CLOSELY

Crated six each of two or more sizes nested.

MANUFACTURED BY

KIECKHEFER BROTHERS COMPANY, MILWAUKEE, WIS.

THE SIMPLEX ROASTER

An article which is in demand at this season of the year.

Practical, Durable, and Serviceable.

No. 08, 10 x 15 x 6½ in.

No. 09, 12½ x 17½ x 6½ in.

WITH OR WITHOUT

RACKS.

Made of smooth finished, cold rolled steel, with a fastening device in the handles (not shown in above cut, which draws together and securely fastens the two Pans, making a Roaster which is beyond criticism. ***The best low priced Roaster in Market.***

WRITE US FOR PRICES.

SIDNEY SHEPARD & CO., - Buffalo, N. Y.

WILLIAM VOGEL & BROTHERS,

SHEET METAL SPECIALTIES,

STAMPING AND PRESS WORK IN EVERY VARIETY.

PLAIN and DECORATED SEAMLESS BOXES for OINTMENTS, BLACKING, &c.

ROUND and SQUARE CANS for PAINTS, OILS and VARNISHES.

OILERS, SHEET-METAL SCREWS and TINNERS' TRIMMINGS.

37 to 47 South 9th St.,
433-435 Kent Ave., } *BROOKLYN, N. Y.*

NEW All Iron, Galvanized SAFETY COAL SIEVE AND COVER.

Pat. applied for.

No wooden hoop or cover to break; will not rust, and is just the thing for HOT ASHES; and used on our **SAFETY ASH BARREL** is DUST PROOF.

MANUFACTURED BY

DOVER STAMPING CO.

BOSTON, MASS.

Also makers of a full line of Galvanized Sheet Iron Wares, Factory Fire Buckets, Oily Waste Cans, Garbage Pails, Chamber Pails, Coal Hods, Oil Cans, Ash Barrels, etc.

SEND FOR CIRCULAR.

—SANDY (after a prolonged contemplation of preserved zoological specimens)—And what's that stuff in the bottles?

Donald—Speerits, Sandy—Whusky.

Sandy—Eh, mon, what a graund death!—*N. Y. Press.*

SOLE MANUFACTURERS OF GRANITE IRON WARE

St. Louis Stamping Co.,

ST. LOUIS, MO.

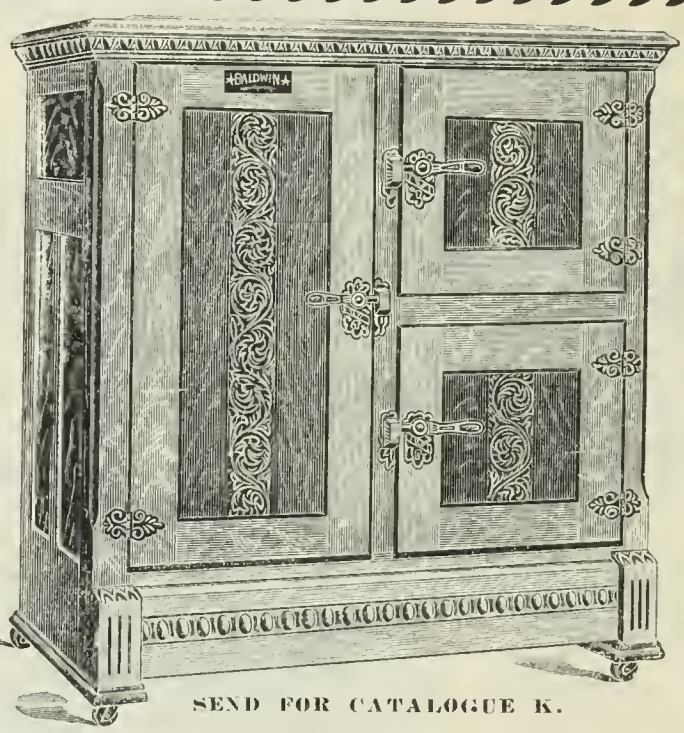
—MANUFACTURERS—

Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: *NEW YORK.* *CHICAGO.* *BOSTON.*



SEND FOR CATALOGUE K.

BALDWIN

Refrigerators.

New,
Neat,
Natty.

BALDWIN DAIRY TRADE MARK REFRIGERATOR

125 Varieties,
Popular Sellers,
Popular Prices.

PROMPT SHIPMENT. EXCLUSIVE SALE.

BALDWIN REFRIGERATOR CO.,

BURLINGTON, VERMONT.

—How He Made a Saving.—"That mine in Toulumne county is costing me a mint of money," said a local capitalist to one of his employes. "I wish you would figure around and see if you can't make a saving somewhere. If you can I'll raise your salary $50 a month.

"But suppose I can't make a saving of $50 a month?" inquired the young man.

"Well, I've tried to figure it out myself, and I can't find where I can save a cent. If you can you are worth $50 a month more."

"All right, sir, I'll look into it."

The young man went over all the accounts, but he could not find where he could cut down a single expense. Finally it occurred to him that he was drawing $25 a month for acting as secretary of the mining company.

"I've found a place where you can save $25 a month," he informed his employer the next day. "I've cut off that salary of $25 a month we've been paying the secretary for doing nothing."

He got his raise.—*San Francisco Post.*

—Voter—I challenge Shamus Macfogarty. He's no Dimmicrat.

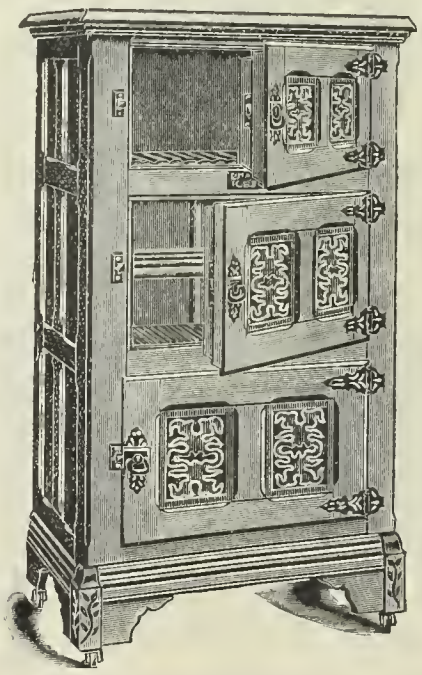
Chairman—Give in yer ividence.

Voter—His wife borrows butter of Mrs. Robinson, a Republican.

Chairman—But I hear she niver pays it back. Yer all right, Mr. Macfogarty. Ye can vote.—*Boston Transcript.*

"Buy the Best."

The Challenge Iceberg Refrigerator.



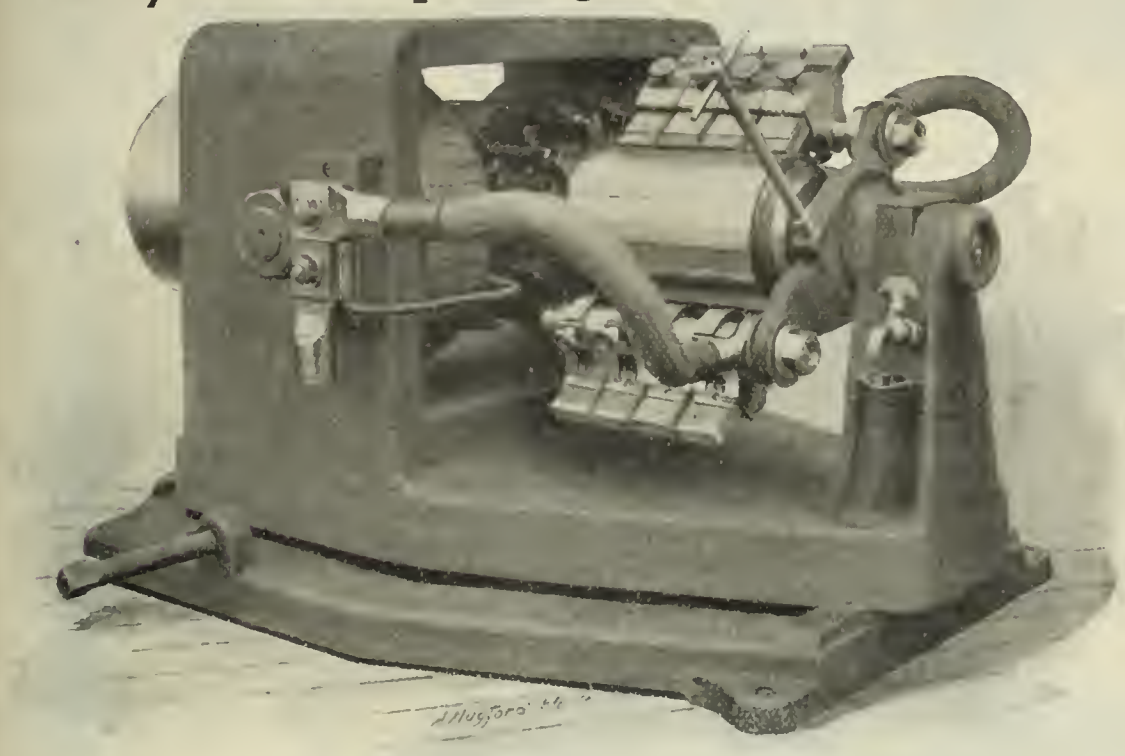
Large dealers in first-class refrigerators will do well to ask for our 1898 catalogue and discounts.

WRITE TO THE

Challenge Corn Planter Co.,

GRAND HAVEN, MICH., U. S. A.

Eddy Electroplating and Electrotyping Dynamos.



Bar wound armatures.

Large commutators insuring cool operation at full load.

Low speed, reducing the wear of the commutator to a minimum.

Rheostats with machines for the regulation of the voltage.

Output of machines guaranteed.

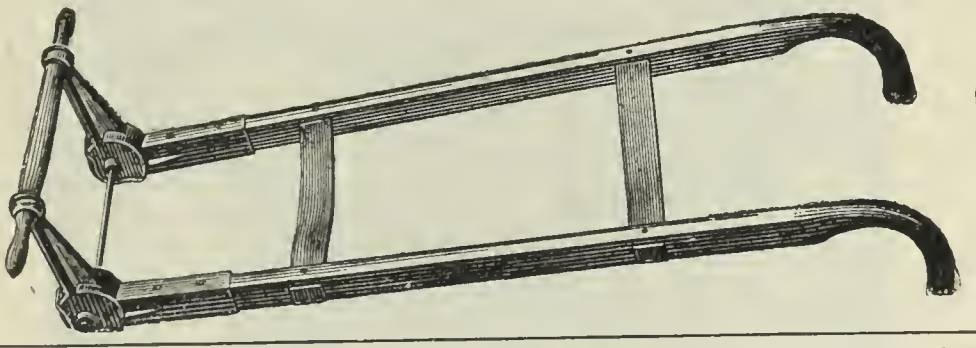
No sparking at the brushes.

Little attention required for operation.

Write for catalogue.

THE EDDY ELECTRIC MFG. CO.,
WINDSOR, CONN.

PATENT
Stove Truck
AND
Carrier
MADE IN THE BEST MANNER
SEND FOR PRICE.



MANUFACTURED
BY
C. S. Mersick & Co.,
NEW HAVEN, CT.

HANDLED
BY ALL
LEADING JOBBERS

High Grade Enamel Ware.

This Trade Mark on bottom of each article.

DOUBLE COATED and ABSOLUTELY PURE

AGATE NICKEL-STEEL-WARE L & G MFG. Co.

Contains no ARSENIC, ANTIMONY, LEAD or other poisonous ingredients.

Others may claim purity, we alone substantiate it by chemist's certificate attached to each article.

"We have made a critical examination of the products of nearly a score of the manufacturers of such goods, and the only articles of the kind found to be absolutely free from all the dangerous contaminations of which mention has been made are those known as 'Agate Nickel-Steel Ware.' The makers of this ware possess an exclusive patented process by which, through the intervention of a coating of nickel, the impervious or enamel coating is caused to adhere to the steel, thereby doing away with the necessity of a lead bath or the employment of antimonial or arsenical preparations to achieve such results."—C. H. Brace, M. D., in *American Journal of Health*.

FOR SALE BY ALL REPUTABLE DEALERS.

Write for free booklet containing startling information about

ENAMELED COOKING UTENSILS

LALANCE & GROSJEAN MFG. CO.
NEW YORK. CHICAGO. BOSTON.

SPERRY'S HOLLOW-WARE....

Is original in shape and finish. A little better and unlike the rest. Spiders and Griddles particularly nice. Not so high-priced either.

Not sold by Jobbers.
Write us.

D. R. SPERRY & CO.,
HOLLOW-WARE FOUNDERS.
BATAVIA, ILL.

—THE following curious epitaph is in the graveyard of Lydford Church, Dartmoor, England:

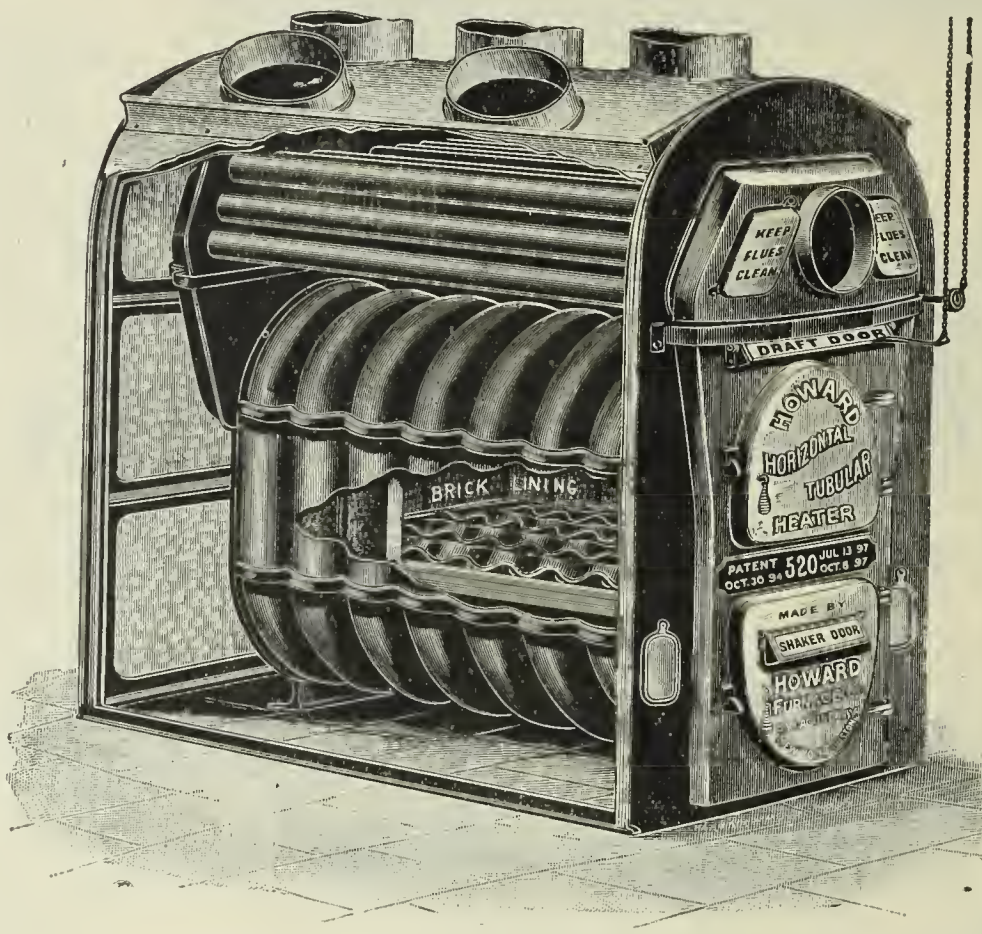
Here lies in horizontal position
the outside Case of
George Routleigh, Watchmaker,
whose abilities in that line were an honor to his profession.
Integrity was the Mainspring and
prudence the Regulator
of all the actions of his life.
Humane, generous and liberal,
his Hand never stopped
till he had relieved distress.
So nicely regulated were all his motions
that he never went wrong
except when set a-going
by people
who did not know his Key.
Even then he was easily
set right again.
He had the art of disposing his time so
well that his hours glided away
in one continual round
of pleasure and delight,
till an unlucky minute put a period to
his existence.
He departed this life
Nov. 14, 1802,
aged 57;
wound up
in the hopes of being taken in hand
by his Maker,
and of being thoroughly cleaned, repaired and set a-going
in the world to come.

—*New York Tribune.*

—"THE Washington Post" tells a story of one of many private secretaries in Washington, who is still new to his honors. One day a newspaper woman, full of business, burst into the office of this secretary's chief. The great man was out. "Can you tell me when he will be in?" she asked. "Really," drawled the clerk, "I haven't an idea." "Well," said the newspaper woman, as she turned to go, "I must say you look it."

a succinct statement

Some manufacturers of furnaces have an idea that they can fool the dealers by talking about a large flue radiator. The proper way to utilize the fire travel is to retard the draft. The impinging properties of the heat are in this way gained. If the fire travel be split up into a number of small flues, immediately after leaving the combustion chamber, a retention of heat is obtained, and five (5) times more heating surface is exposed for generating warm air.



Patented: Oct. 30, 1894. July 13, 1897. Oct. 5, 1897.

does this astonish you?

The truth of this statement is aptly illustrated in the cut, which shows a tubular constructed radiator. It is a self evident fact that if the above radiator were made in one large flue, the heat in its travel to the chimney would be quickened, a less contact surface given and a cooling influence avoided.

THE MAKERS,

Howard Furnace Co.,

Syracuse, N. Y.

NEW YORK OFFICE,
231 Water St.

BOSTON OFFICE,
198 Spruce St. (Station H), Chelsea.

THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, December 4, 1897.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

BUSINESS OFFICES:

NEW YORK.....232-238 William Street.
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ST. LOUIS.....Commercial Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon Street, London, England.

Volume XLVIII.....No. 23.
Index to Reading Matter.....Page 60.

The Business Situation.

The opening of December marks the beginning of the stock taking season and a consequent falling off in the volume of business, except in the line of holiday goods, is to be expected. Dealers are reducing their stocks so as not to carry over more goods than necessary into next year's account. Travelers are generally off the road and are engaged in planning their spring campaigns. Nevertheless, at the present time there is considerable business doing, especially in the territory west of the Mississippi, where country merchants are still buying freely. In the South, too, trade, which was delayed by the yellow fever quarantine, is moving with unusual briskness. This accounts for the maintenance of surprisingly large figures in the recent weekly returns of bank clearings, for speculation has been so abnormally dull of late as to constitute a comparatively small factor in the general business account. Last week's clearings throughout the country, in spite of the occurrence of the Thanksgiving holiday, totaled up to considerably over a billion dollars, and were 11 per cent. larger than in the corresponding week of 1896. The demand for seasonable and holiday articles is reported as much better than usual and the setting in of steady cold weather has stimulated the sale of all kinds of winter goods. In general trade, however, the demand has fallen off and is not likely to revive during the balance of the year. There is every prospect for a large spring business and for this desirable consummation merchants and manufacturers are making active preparations. All anticipations for 1898 are decidedly of a hopeful complexion. The approaching meeting of Congress exercises a restrictive influence on stock exchange operations. But the feeling is growing that the President's message will be a peaceful and reassuring document as regards the relations with Spain. As the threatened Cuban complications have been for long among the most effective weapons used by the "bear" traders in their assaults on prices, the growing assurance of a peaceful settlement of the matter has contributed to a return of steadiness and strength in the stock market. Transactions have been, however, on a narrow scale. The iron and metal trades generally are quiet, with no change of importance in the character of business or in prices. Money is still very easy, notwithstanding that some large sums have been loaned to London. Exports of agricultural and manufactured products continue heavy and far exceed the imports. The balance of foreign trade in our favor for November is estimated at about $60,000,000. Collections are generally referred to as satisfactory.

The Solution of a Heating Puzzle.

It is not so very long ago that the first gas radiators came into use, and about the same time lamp heaters and other small kerosene heating stoves were introduced, the principle in all cases being the utilization of a drum of sheet metal, which was placed over the lamp and imparted heat to the room. A good many people were puzzled at the time, and not a few are still puzzled, to understand why the intervention of a sheet metal drum over a flame should alter the heating efficiency of the apparatus. Take, for instance, a lamp stove burning kerosene oil. The flame burns the same as in a lamp, and for every pint of oil consumed a certain number of heat units are generated. It stands to reason that this heat must go off into the apartment in which the lamp is placed, and it would seem that the warming effect of the lamp would be just as great without a sheet metal drum as with it. We speak of the matter in this place to call attention to an article that appears in our Letter Box department in this issue, under the title of "The Benefit of a Radiator Over a Flame." A correspondent asked the simple question as to what effect an oven placed over a burner will have upon heating the room. We have obtained an answer, and thorough discussion of this question from Prof. J. H. Kinealy, the well-known writer on heating topics, and we feel assured that all our readers who are in any way concerned in this problem will be very much interested and perhaps benefited by reading the clear exposition given by Professor Kinealy. He treats the problem very simply and shows just why the practical effect of an oven or radiator of this kind is important. The actual heat from the flame is neither increased nor decreased, but its practical efficiency is decidedly augmented by interposing a drum which enables the fire, in this case an oil flame, to dispense its heat by radiation instead of solely by convection, and it is due to this transmission by radiation that the apartment appears to be better heated. In such a case the temperature of the air is perhaps not so much increased, or no more influenced, than would be the case with an uncovered flame, as might be tested by a thermometer properly shielded from the source of heat. In the presence of the radiant heat from the drum, however, an occupant of the room is more comfortable than if the radiant heat was absent and a higher air temperature prevailed.

Orders were received at Fostoria, Ohio, last week from the headquarters of the Northwestern Ohio Gas Company, at Toledo, that the natural gas would be turned from the Fostoria lines on December 31 next. It is understood that the officials of the company fear that their supply of gas next year will not be sufficient to meet the demand; owing to the waste that has been going on. Grave fears are entertained that the Ohio Gas field is nearly exhausted.

THE LETTER BOX.

The Benefit of a Radiator Over a Flame.

From G. S, Jackson, Mich.—Suppose a burner on a gasoline or oil stove is lighted to warm a room, will the same amount of flame make more heat in the room by placing the oven over the burner, and, if so, why?

Answer.—We submitted this inquiry to Professor J. H. Kinealy, St. Louis, who comments upon it as follows: This is an extremely interesting and important question. But in order to discuss it we must suppose that when the oven is put on the stove nothing else is changed, and that exactly the same amount of gasoline or oil is burned per hour with the oven on as was burned when it was not on. The amount of heat generated per hour by a flame depends only upon the nature of the substance burned and the weight of it burned per hour. For every pound of gasoline or oil burned in the stove there is generated a certain fixed amount of heat, which is entirely independent of whether the oven is on or off, and which depends only upon the quality of the gasoline or oil. All of the heat generated in the room per hour by the stove is used in heating the room, whether the oven is on or off. But the part that is effectively utilized is very different in the two cases.

When the oven is not on the stove the room is warmed entirely by convection, or currents of air set up in the room. The hot products of combustion rise from the flame, and at once mingle and mix with part of the air, which is heated. This hot air and the products of combustion rise to the top of the room and spread over the ceiling. The air of the room is hottest near the ceiling, and is coolest near the floor. The hot air near the ceiling comes in contact with the walls of the room, is cooled, and falls along the walls to the floor. It flows then along the floor to the stove, and then is heated and rises to the ceiling again. Thus there are upward currents of hot air at the stove, currents along the ceiling to the walls, downward currents along the walls to the floor, and currents along the floor to the stove. A hot gas or a hot flame has an exceedingly small radiating power, so that objects in the room will derive almost no heat from the stove unless the hot air comes in contact with them. And unless the amount of heat generated by the stove is quite large, the whole air in the room will not be circulated much. A part of the heat generated will be concentrated at the ceiling, where it is of little use in heating objects in the room, and a part will be brought directly to the cool walls, through which it will pass to the cool air on the outside.

When the oven is on the stove the hot products of combustion from the flame come directly in contact with it and give to it a large part of their heat before mixing with the air and rising to the ceiling. The oven acts as a reservoir of heat, catching it from the flame and storing it up before it can be carried to the ceiling and the cold walls. As the oven becomes hot it gives off its heat by radiation, and the bodies in the room that are nearest to the oven receive the greatest amount of the radiated heat. If there are many people or objects in the room close to the stove they will receive almost all of the radiated heat from the oven, and the cool walls will receive very little. The air in the room receives almost none of the radiated heat from the oven, as radiant heat passes through air with almost no loss. But some of the air comes in contact with the hot oven and is heated. This warm air mixes with the products of combustion when they leave the oven and rises to the ceiling, then flows to the walls, and then falls to the floor. Thus, when the oven is on, a small part of the heat generated is carried to the ceiling and walls by convection currents, but a large part of the heat is first stored up in the oven, and is then radiated to objects near the stove. When these objects are heated they give heat to the cool walls.

To sum up, then: When the oven is not on almost all of the heat is carried away from the stove to the ceiling, and then to the walls, through which it passes and is lost. But when the oven is on a large part of the heat is received by it, and then most of it is given to the objects in the room, and they give a part only of what they receive to the cool walls.

When the oven is on the occupants get more benefit from the heat generated than they do when it is off.

Heating by Steam to a High Temperature.

From J. R. R., Brooklyn, N. Y.—Please answer the following in *The Metal Worker:* How many feet of radiation will it require and under what pressure should a steam boiler be run to maintain a temperature of 215 degrees in a warming box of the following size and construction: The box to be 19 feet long, 3 feet wide and 6 feet high, built of 1-inch rough boards with close joints; the inside of the box to be lined with IC bright tin; the coil to lie on bottom of box and to be built of 1-inch pipe. The box will be in a room where the temperature is about 50 degrees in cold weather, and will have sliding doors on the front. Should the box have a cold air supply, and of what size? Would I get any better results by putting the coil upright along the wall instead of on the bottom of the box? Is it possible to maintain a temperature of 215 degrees with hot water circulation? I have a box of the above size and construction in which I have a coil of 1-inch pipe containing 140 feet of radiation, 1-inch pipe flow and 1½ inch return. A hot water boiler is set on the floor below and has a capacity of 300 square feet of radiation. I have closed the expansion tank and run the boiler under pressure. Steam forms in the radiator at times and stops circulation, forcing the water up to the expansion tank, which shows a pressure of 10 pounds. I have air valves to relieve it, but I can only get 135 degrees of temperature in the box. Can you offer any remedy?

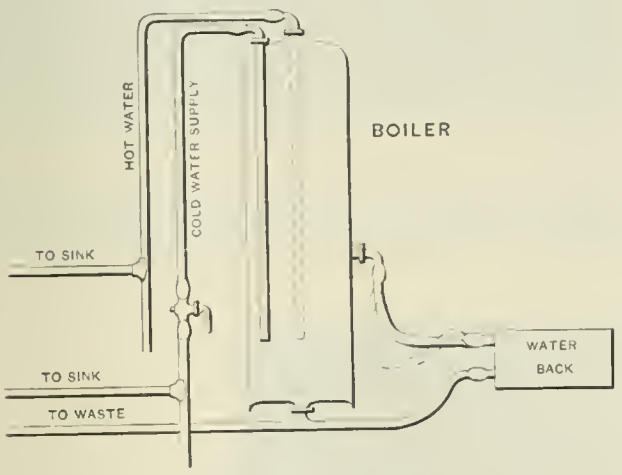
Answer.—The successful heating of a room or oven depends very much upon the use for which it is made. If the material to be subjected to heat is bulky and very moist a much larger amount of heating surface and a higher steam pressure is required than for the mere warming of goods that have no moisture to be evaporated. As our correspondent has not enlightened us on this point we will assume a medium condition, which may be varied to suit the actual case. We also surmise that the sliding doors are on the long side of the room, reaching to or near the top. We apprehend that very little ventilation will be needed, as our experience with this class of drying rooms is that the doors are never tight and that the repeated opening and closing of several such doors in a long narrow room tends very much to ventilate to its full requirement. The room, containing 342 cubic feet of space, should have 200 feet, more or less, of 1 inch pipe, to consist, for best effect, of a five-branch tee coil entirely around the room and running past the doors with the hooks attached to the door posts, if that is the construction. Otherwise the coil may be placed on the back and ends of the room and the balance placed flat a few inches above the floor, and next to the doors. With such a coil and a fairly tight room there should be no difficulty in maintaining a temperature of 215 degrees or more with 40 pounds of steam in the boiler and a clear circulation. The temperature of the steam in the boiler at 40 pounds pressure is 287 degrees F, and the temperature required

in the room is 215 degrees, so that you have a margin of only 72 degrees in which to transfer the boiler temperature to the air temperature in the room, through some length of feed pipe and the coils. This is why the large amount of pipe surface in the room is needed. As to the hot water arrangement, we cannot give much encouragement. Ten pounds water pressure could only give a temperature in the circulating water of 240 degrees, only 25 degrees above the required temperature in the room. This, with the impeded circulation caused by generation of steam and small size of the pipes and connections, accounts for our correspondent's disappointment. A closed system of hot water circulation under the pressure of the city water works, with the above amount of pipe coils and large, easily circulating feed and return pipe, will give about the same results as with steam at the same pressure.

Why Water Did Not Heat.

From F. B., New York City.—I submit herewith a sketch of a boiler and its connection which I found, and which did not work satisfactorily. I am a young man and send this in to show how little some people care about their work, and hope that you will present it in *The Metal Worker* to show workmen the mistakes. The dotted lines show the arrangement of the piping as it was found, and also the location of the delivery tube in the boiler. The solid lines show how the job is connected at the present time, and I am pleased to say that it works satisfactorily.

Note.—We are glad to hear from any young man who takes an interest in doing work in a proper manner. The



Why Water Did Not Heat.

job as found shows the delivery tube connected with the hot water service pipe at center of the boiler and the cold water supply connected at the top; consequently, unless all the water in the boiler was hot there would be no likelihood of hot water being drawn from the boiler, and even under such conditions it would be possible for the cold water to make a short circuit direct to the delivery tube and out. It is not strange that the service was unsatisfactory. The delivery tube should always be connected with the opening to the boiler that is nearest to the outside. The piping in the water back, as shown by the dotted line, had a very effective trap in it which would seriously interfere with circulation. It is well to provide enough extra length in the pipe to allow for a free expansion and contraction, but there should not be such a quantity as to permit the pipe to sag and form a trap. Our correspondent has done the right thing in connecting the pipe so as to avoid a trap.

Right and Left Fittings.

From J. F. C., Providence, R. I.—I notice the article on right and left fittings in the Letter Box of November 20, and as the fittings shown are designated differently from what is our custom I inclose a circular showing cuts of fittings that are described as having what we call right and left hand side openings, so that I may learn which is right. In all the printed lists that I have seen the fittings are designated the reverse of those shown in *The Metal Worker*.

Note.—This correspondent brings up an interesting point. We had previously conferred with some of the largest manufacturers and dealers in soil pipe fittings, and while all did not agree we assumed that the houses doing the largest business in this particular line were the best qualified to decide this point. On the receipt of the letter of this correspondent we investigated further, and find that the proper method of deciding right and left fittings is still an undecided question in the trade. It is not an uncommon thing for one supply house in sending an order to another to accompany the order with a sketch so as to avoid any possibility of mistake. In other instances the orders will read "the reverse of the cut shown in your catalogue." The decision as to whether a fitting is right or left depends upon the position occupied by the person looking at it. It is assumed by those who entertain the same opinion as our correspondent that the proper place to look at the fitting is from the same position that it would be necessary to look at it if it were in place in a building, and this would be the reverse of the position mentioned in the article in *The Metal Worker* referred to.

Battery for Electric Lights.

From J. K., Kentucky.—Could a 20 or 30 light (incandescent) dynamo be run by cells or batteries, and how many lights could be obtained by a dynamo run in this way—I mean if the batteries were large? I suppose you could not make the light without the dynamo. We have the dynamo and would like to use cell batteries to run it, as steam is costly and troublesome for 12 lights, which is all we need.

Answer.—An electric generator cannot be run directly by a battery. The battery must operate a dynamo motor and the motor may drive the generator. By this arrangement 50 per cent. of the lighting power of the battery is lost; so that if a battery is to be used at all it should be in direct conection with the lamps. If your dynamo is a generator a small gasoline engine will be the best and cheapest method of operating the generator. For 20 incandescent lamps, say of 16 candle power each, you will need 2 horse-power. With a gasoline engine it will cost about 2 cents per hour for the fuel, and but a few minutes per day for its care. If you use a good form of battery for direct lighting you will need not less than 80 cells for 20 lights, the lamps to be made for low voltage.

Tight Serviceable Joints.

From Paterson, N. J.—Will *The Metal Worker* please inform me if it is proper to use a rubber washer on a coupling under the ground? I have been informed that it is not, because in time, it is said, the washer will rot out. I would also like to know if when a coupling is screwed up tight and water is turned on it is found to sweat a little between the coupling and the solder, it is liable in time to cause any noticeable trouble? This last trouble has occurred several times, and I have formed the opinion that it would make up tight, as I think the sweating is caused by contraction in the pipe owing to the cold water being turned on.

Note.—It has generally been considered that all joints under the ground should be made without the use of washers of any kind, as the best material is liable to rot out in time and permit leakage. If the leak in the second case presented is in the coupling proper it should be screwed up tight enough, so that the leaking cannot occur. If there is a leak through the solder it shows that the material on which the joint has been wiped has not been properly tinned and prepared before wiping, and it also shows that either the solder used in the wiping is too coarse for the work or the joint has not been wiped quickly enough; consequently the joint is not as solid as it should be. If the water seen is due to condensation it would show all along the pipe that is exposed to the air.

Address Wanted.

From M., Confluence, Pa.—Will some of the readers of *The Metal Worker* please inform me who makes the Champion rat trap?

Machine Molding Without Stripping Plates.*

BY E. H. MUMFORD, PLAINFIELD, N. J.

Molding machines may be classed under three heads: 1. Machines which only ram the molds, and, when the ramming is done by means of a side lever by hand, are generally called "squeezers." 2. Machines which only draw the patterns, the ramming being accomplished by the usual hand methods. 3. Machines which both ram the molds and draw the patterns, ramming either by a hand pulled lever or by fluid pressure on piston or plunger and drawing the patterns through a plate called a "stripping plate" or "drop plate"—till recently the usual method—or, without the use of this plate, fitting everywhere to pattern outline at the parting surface, the patterns being effectively machine guided in either case.

It is to the third class that the machine which is used to illustrate the subject of this paper belongs, and which would seem to have enough that is novel in the application of machinery to the foundry to merit the attention of the society. At the risk of appearing pedantic, but with a view to developing an appreciation of the true function of the method of pattern drawing used in this machine, attention is called to the following sectional views of molds and ways of drawing patterns occurring in machine molding. Fig. 1 shows an ordinary "gate" of fitting patterns being drawn from the drag or nowel part of the mold by means of a spike and rapper wielded by the molder's hand after cope and drag have been rammed together on a "squeezer" and cope has been removed. Frequently the pernicious "swab" is used to soak and so strengthen joint outlines of the sand before drawing patterns, in such cases as this. In this case, before cope is lifted these patterns must be vigorously rapped through the cope; an amount depending (and so does the size of the casting) upon the mood and strength of the molder.

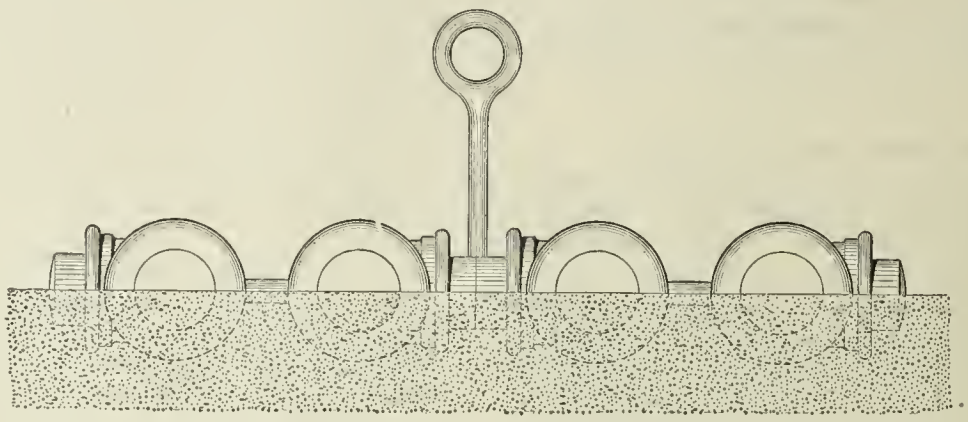


Fig. 1.

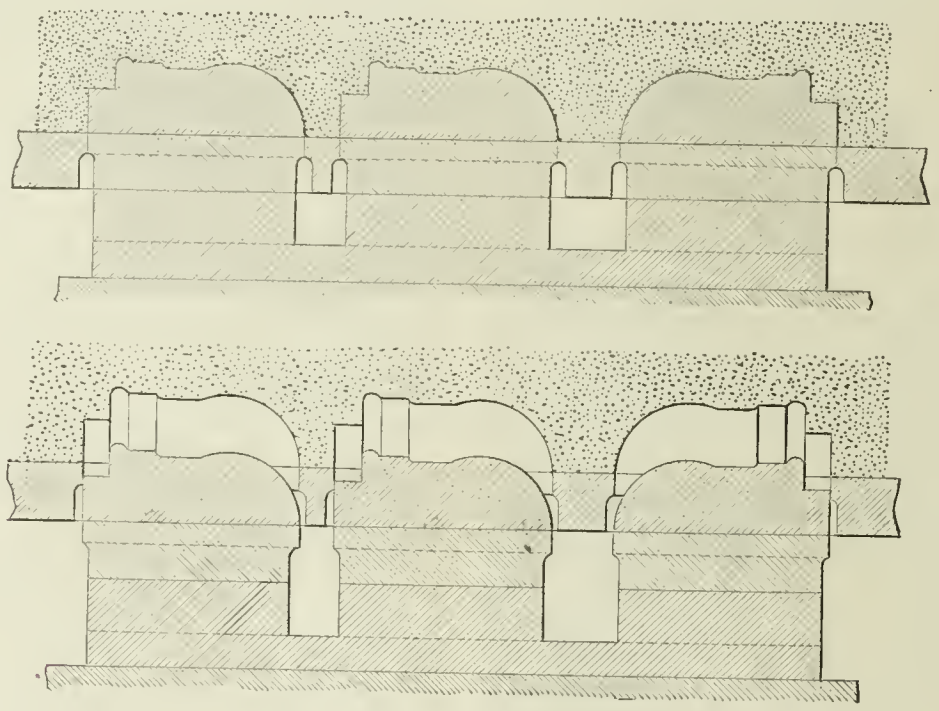


Fig. 2.

Fig. 2 shows the stripping or drop plate method of drawing patterns. In this method the patterns are not rapped at all and are drawn in a practically straight line so that the mold is absolutely pattern size. The stripping plate is fitted accurately to every outline at the joint surface of the patterns, obviously at considerable expense, and, of course, at the instant of drawing the patterns supports the joint surface of the mold entirely. This is at first sight an ideal method of drawing patterns, and it has for years been the only method practiced on machines. It has two disadvantages. The patterns are separated from the stripping plate by the necessary joint fissure between the two. Fine sand continually falls into this and, adhering to the joint surfaces more or less, grinds the fissure wider. This leads to a gradual reduction of size of patterns on vertical surfaces and a widening of the joint fissure often to such an extent that wire edges are formed on the mold, causing, on fine work, "crushing" and consequently dirty joints. A nicely fitted but worn plate of 24 pieces which had cost, at shop expense only, $250, was recently replaced by a plate of 28 pieces, fitted ready for the machine under the new system about to be described for not more than $25. The stripping plate method has another drawback, not always appreciated, probably because accepted as inevitable. Stripping plate patterns are not rapped, and there frequently occur on surface of patterns, remote from the action of the stripping plate, rectangular corners just as important to mold sharply as those at the parting line. Such corners have either to be filletted or "stooled" in stripping plate work, and neither method often is practicable. When the entire pattern and plate are vibrated so that the corners where the pattern joins the plate draw perfectly, as they do in the machine to be described, it is obvious that similar corners anywhere on pattern surface will draw equally well.

The vibrating of patterns, or rather of molds, during the operation of drawing the patterns possesses little of novelty. Ever since a bench molder's neighbor first rapped the bench while he lifted a cope or drew a pat-

*Presented at the New York meeting of the American Society of Mechanical Engineers, Nov. 30-Dec. 3, 1897.

tern, the thing has been done in one way or another. In fact, machines are now and then found on the market in which a device like a ratchet or other mechanical means

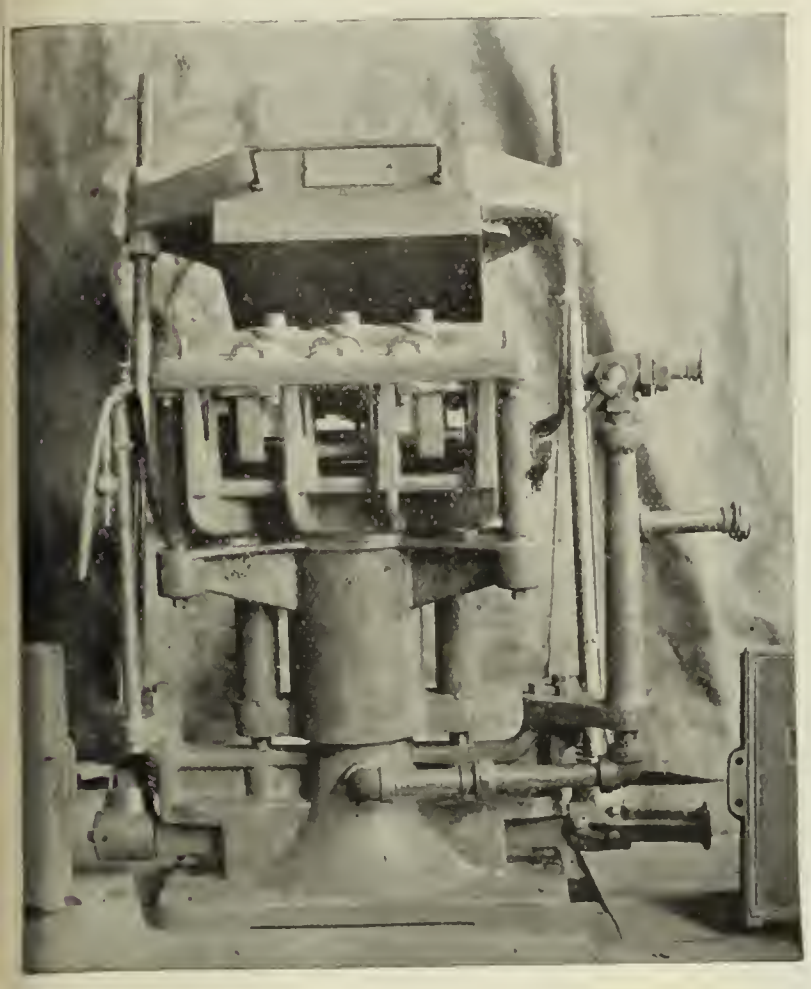


Fig. 3.

for jarring the machine structure during pattern drawing renders the working of easy patterns without stripping plates possible. The idea of applying a power driven

patents to Harris Tabor, and the following figures will serve to illustrate the mechanism. Figs. 3 and 4 show the general appearance of the machine from the side on which the operator stands. Fig. 3 shows the machine ready to receive the flask, the patterns being up ready for molding. Fig. 4 shows the machine after patterns have been drawn and flask lifted off.

Briefly, the operation of the machine is as follows: The ramming head shown thrown back at the top of the machine is drawn into a vertical position after flask has been placed and filled with sand. The three-way cock shown at the extreme right is then quickly opened, admitting compressed air of 70 to 80 pounds pressure to the inverted cylinder shown at the center of the cut. The cylinder with the entire upper portion of the machine is thus driven forcibly up against the ramming head, flask, sand and all. Often a single blow suffices to ram the mold—often the blow is quickly repeated, according to the demands of the particular mold in hand. Gravity returns the machine to its original position, as the three-way cock opens to exhaust. After pushing the ramming head back and cutting sprue, if the half mold is a cope, the operator seizes the lever shown just inside the three-way cock at the right, and, drawing it forward and down, raises the outer frame of the top of machine containing the flask pins, with flask and sand thereon, away from the patterns —thus drawing them from the sand. Just as he seizes the pattern drawing lever with his right hand he presses with his left on the head of a compression valve shown at the left side of top of machine, thus admitting air to the pneumatic vibrator already referred to.

Fig. 5, a rear view of the machine, shows, at the top center, with its inlet hose hanging to it, this vibrator, which is shown in section in Fig. 6. It consists simply of a double acting elongated piston having a stroke of about 5-16 inch in a valveless cylinder, and impacting upon hardened anvils at either end at the estimated rate of 5000 blows per minute. The method of communicating the rapid, yet small oscillations of the vibrator to the patterns and yet keeping them from being transmitted to the rest of the mechanism is this: A frame, called a vibrator frame, to which the pneumatic vibrator is bolted and keyed is shown in Fig. 7. To this frame the plate carrying the patterns often, in cases of patterns having irregular parting lines forming one and the same casting with the patterns, is fastened by the four machine screws, the small tapped holes for which are shown in the corners. In fact, in changing patterns the process consists of simply removing these four machine screws, taking up the

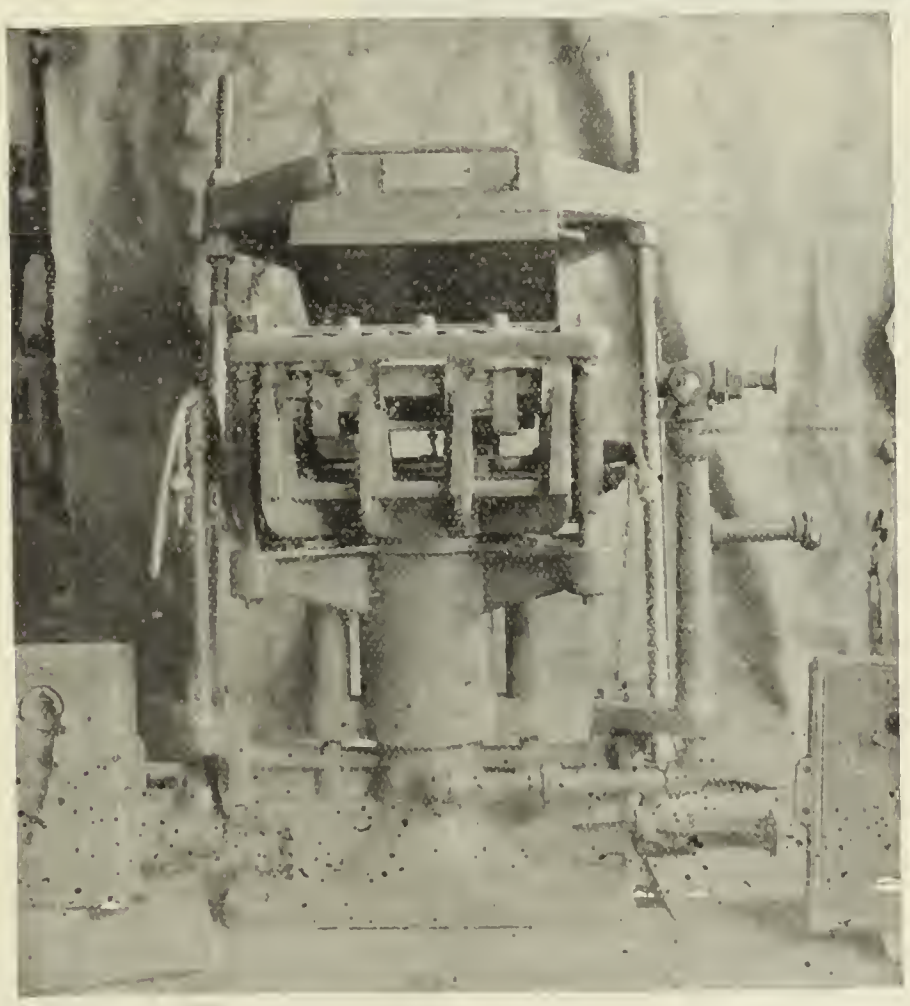


Fig 4.

vibrator directly to the plate carrying the patterns to thus vibrate them independently of other parts of the machine and the flask and sand has been the subject of the issue of

pattern plate and screwing to the vibrator frame the new pattern plate. The vibrator frame itself is secured to the machine structure by the four larger bolts, the holes for

which are shown in the inner corners. These bolts are, as shown in Fig. 9, surrounded by thick bushings. These bushings are elastic to such a degree as to absorb the sharp vibrations of vibrator frame and patterns, while so firm and well fitted as to hold patterns accurately to their position. The action of the vibrator is such as to give to the entire pattern surface an exceedingly violent shiver,

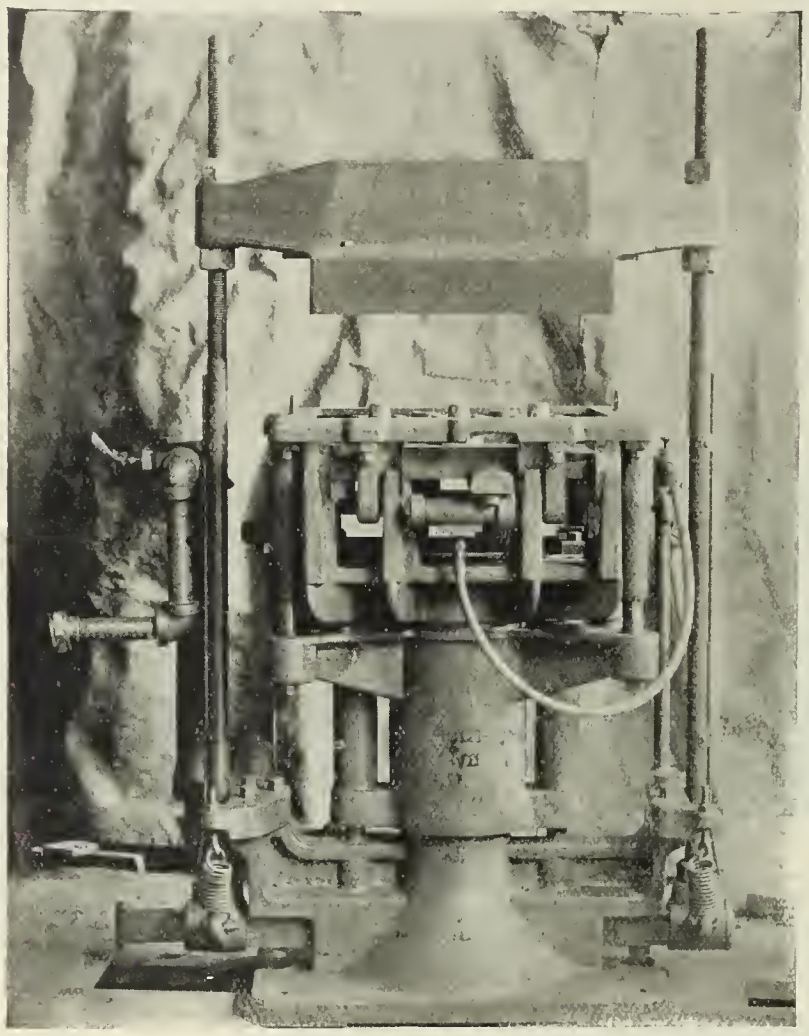


Fig. 5.

making it impossible that any sand should adhere to this surface, while the magnitude of the actual movement of the pattern is so slight that it is found to fill the mold so completely that it is impracticable to draw it a second time without rapping. Yet so truly are the patterns held, and so little disturbed from their original position, that it is perfectly practicable to return patterns to a mold

working as the simpler type, in which the flasks come off in the same way they go on.

Fig. 8 shows a set of patterns as they are ordinarily fitted to plates for this machine. Round holes will be noticed at places in the plate surface. These are openings for the insertion of what are called "stools." When it is found necessary to support the sand surface at any point,

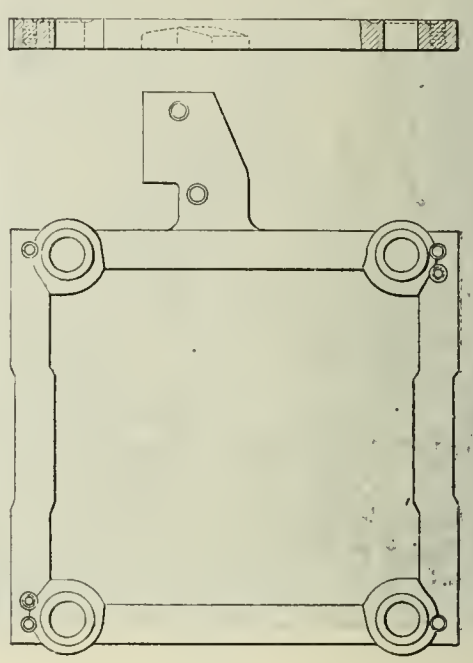


Fig 7.

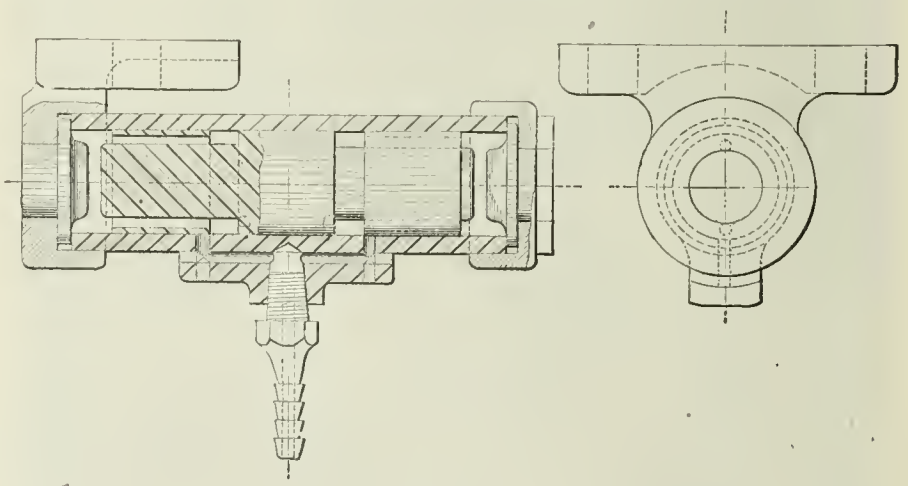


Fig. 6.

having the finest ornamental surface in the ordinary practice of "printing back." In cases where deep pockets of hanging sand occur, which cannot be held during lifting off and rolling over, machines are arranged to roll the flask over in their operation and draw the patterns up under the influence of the pneumatic vibrator, though, owing to the time consumed in the rolling over process (and each operation counts in seconds on a molding machine), this style of machine is not usually as rapid in its

or generally, round holes are drilled through either plate or pattern surface and loose cylindrical pieces are dropped into these holes, their upper end surfaces being flush with the plate or pattern surface and their lower ends resting on the plate called, from this use, a stool plate. This plate appears in Fig. 9 at A, and is hung solidly by the brackets shown at B from the frame which carries the flasks, so that it has the same upward motion as the flasks, and the upper ends of the stools remain in contact with the sand of the mold until same is lifted from machine. Fig. 9, showing a vertical section through a machine, will make perfectly clear the position and action of these stools. As illustrating the importance of being able to work without stripping plates on a line of work which is much more extended than that possible with them, we may say that a machinist with a drill press, supplied with

split patterns and planed pattern plates, has matched and fixed five sets of from four to eight pieces in a day, and wooden patterns fitted for temporary use in the same way

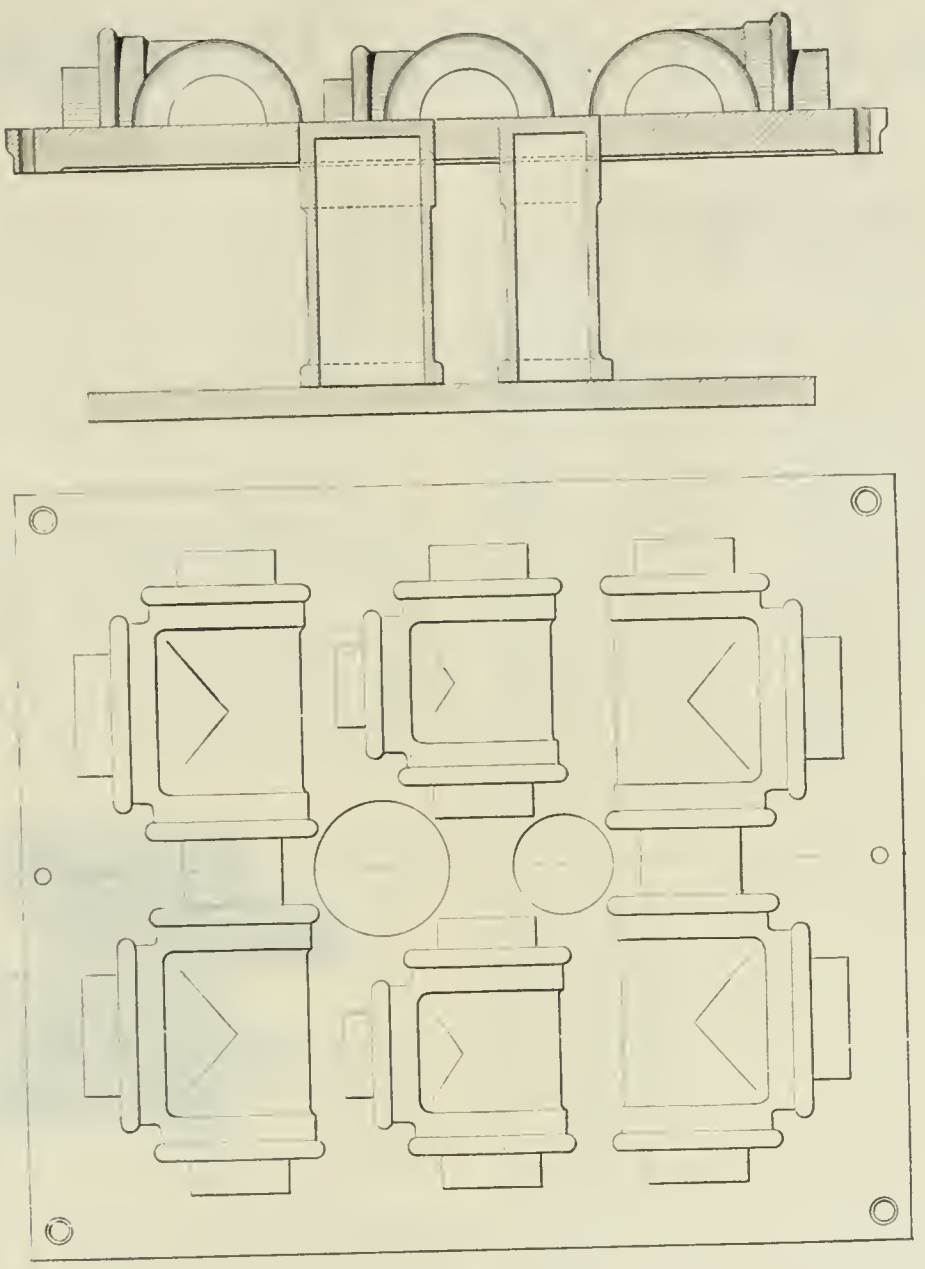


Fig. 8.

are of frequent occurrence when it is not thought wise to go to the expense of metal patterns on account of the relatively small number of castings to be made from them.

It is not, perhaps, too much to say that pattern expense is not the final evil of the costly and not durable stripping plate patterns.

A meeting of some of the principal railway officials of the country was held this week at the office of the Interstate Commerce Commission in Washington, to consider the question of the adoption of a universal system of car coupling. At present there are a great many couplers in use on the different railroads of the country, many of which are in themselves all that could be required, but the use of so many different devices is found to be confusing, and in some instances dangerous to the lives of railroad men who are unfamiliar with them. A bill was introduced at the last session of Congress directing the Interstate Commerce Commission to bring about an adjustment of the difficulty, and in accordance therewith the meeting was held.

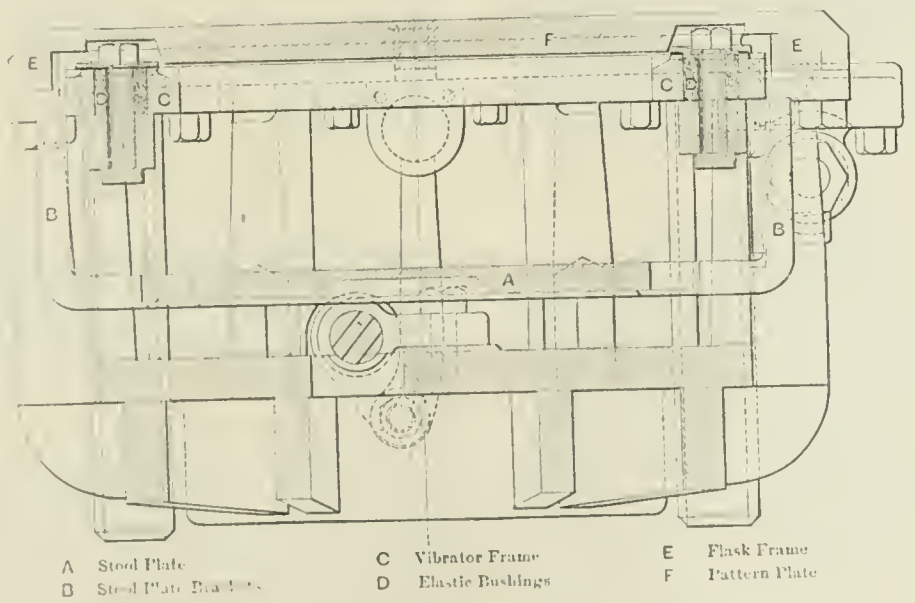


Fig. 9.

HEATING AND PLUMBING.

George Swift.

George Swift, one of Paterson's oldest citizens and a man highly esteemed by every one, died November 24, at his home, 197 Ellison street, Paterson, N. J. Mr. Swift was born in England nearly 78 years ago, and when still a young man he came to America and settled in Paterson, where he served his time with the late William Cundell, a prominent tinsmith of bygone years, and then went to the establishment of Horatio Moses, where he became the foreman of the shop. When the news of the wonderful gold discoveries in California in 1849 agitated the whole country young Swift left his work and left for the gold fields. Fourteen months later he returned—a step that he said he always regretted. When Mr. Swift left Mr. Moses' employ his place as foreman was taken by E. B. King. Soon after his return he and Mr. King formed a partnership under the name of E. B. King & Co., plumbers—a partnership that lasted for 38 years. After the late Mr. King retired from the business it was conducted by Mr. Swift up to two years ago, when he sold out to Howell & Tattersall, and they lately moved from the old stand to Washington street. He was a prominent member of the Methodist Church and an Odd Fellow. He was married three times and is survived by a widow and two daughters.

Plumbers' Certificates.

The members of the Board of Plumbing Examiners of the city of Peoria, Ill., have finally completed the making out, signing and sealing of the certificates for both master and journeymen plumbers of the city. The certificates have been issued to the men who lately passed the examinations, and from this time on all plumbers, either master or journeymen, must have their certificates handy so as to be prepared in case they should be called upon. The following is a list of the successful plumbers of both classes :

Master Plumbers.—Michael Conlon, Edward O'Connor, Daniel O'Connor, William W. Murphy, John A. Nailon, Andrew O'Neill, John W. Simpson, Charles W. O'Neill, Frank McLoughlin, Sr., Rud G. Trefzger, Edward H. Donohue, Fred. F. Studer, Arthur Antcliff, Richard Errion, James McGlinn, Christian Klingle.

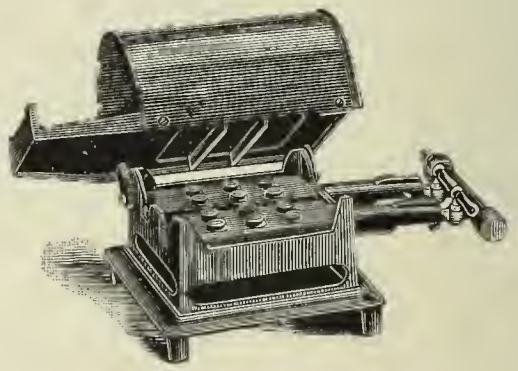
Journeymen Plumbers. — Thomas McQuellion, John Gaelder, William O'Connor, Samuel A. Doyle, Fred J. Kraft, Michael T. Sullivan, Peter Kelley, Frank McCormick, Adolph Prohmer, John Loock, Frank B. Babbitt, Thomas Buckley, Mark Martin, James B. Donahue, John W. Kneer, Michael Kavanaugh, George Kramer, John P. Ryan, Rudolph Klingle, John B. Rose, Patrick Guheen, John O'Connell, John Noonan, Thomas R. O'Brien, Thos. J. Cody, Fred Herder, Patrick Kelley, Samuel B. Dooley, John Smith, James F. Smith, James B. Campbell, Thomas O'Connor, William F. Smith, Milton F. Hitchcock and Charles Murphy.

A New Business Building.

Hunting, Weeks & Corcoran have nearly completed their handsome new brick block at 26 Factory street, Watertown, N. Y., and the firm will occupy it the first of the coming year. The lot is 75 x 225, extending from the railroad switch on the one side and fronting on Factory street. The office is on the ground floor, plate glass windows facing the street. It is separated by a glass partition from the rear portion of the floor, which will be used as a showroom, where the latest designs in plumbing fixtures will be shown under water pressure. The first floor is very strongly built and will hold 1000 pounds to the square foot, giving 20,000 square feet of floor surface. An hydraulic elevator has been put in. In the rear of this floor a large stock of sheet iron and American tin plates will be kept and a stock of the Cookly K imported plates for making cheese vats. The second floor will be used for bins for fittings, over 3000 different sizes being carried, also valves and brass and nickel plumbers' goods, engineering supplies, rubber hose and packings. The third floor will be used for the storing and display of tin and sheet iron household utensils and tinners' supplies. The firm use two carloads of stove elbows alone in a season, which will show the extent of this part of the business. In the basement is located the heater, hot water being used to warm the building, and bins for soil pipe fittings, and large goods not conveniently kept in other parts of the building will also be stored there. At the rear of the lot and close to the switch there has been erected a pipe storehouse very conveniently located. The firm deal largely in this line. There is also put up near there a power pipe machine, cutting and threading pipe 2½ to 8 inches, which will be run by electricity. Altogether they will carry a most complete line of supplies for plumbers, tinners and mills and house furnishing materials.

The Orchard Gas Soldering Furnace.

In the accompanying illustration we show the Orchard gas soldering furnace, which is being put on the market by Orchard & Woodworth, 14 Frankfort street, New York City. The furnace is made single for the use of one iron and double for heating two soldering coppers in three different sizes, with 8, 12 and 16 gas burning orifices. A feature of the burner which contributes to its efficiency is the construction which furnishes a central draft. The gas is admitted through the usual mixing device into a chamber, from which it finds exit through a circular opening to



The Orchard Gas Soldering Furnace

the point of ignition. The circular opening is formed by means of a tube leading through the mixing chamber, so that the inner circle of flame is supplied with pure air as well as the outer side of the flame when the burner is in use, thereby securing a better combustion and a greater heating capacity from the same consumption of gas. It is pointed out that the burners will not smoke or soot. The cover for preventing currents passing over the soldering irons can be removed and the furnace used for melting solder or other purposes. The company also manufacture a large variety of gas furnaces with burners of the same type adapted for various trades and mechanical uses. At the present time they are meeting with a good demand for their Orchard parlor heater, which is provided with a burner of the same type and a perforated planished iron body to be used for heating rooms.

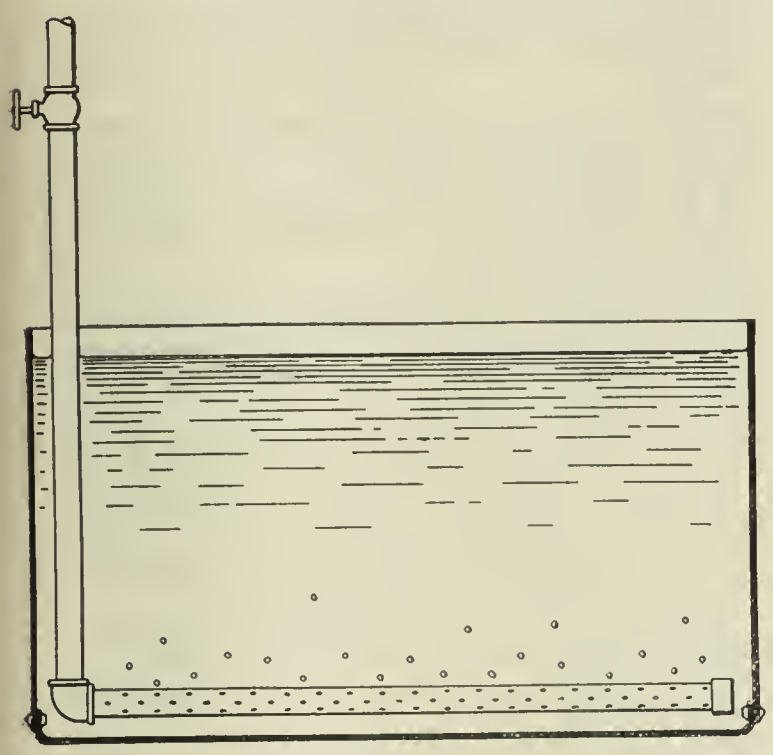
Ventilation of School Houses.

Prof. Alexander Chaplain of Easton recently read a carefully prepared and instructive paper before the annual meeting of the Association of School Commissioners of the State of Maryland at Baltimore on the following subject : " In the Construction of New Schoolhouses, with Limited Means, What Is the Best Plan for Ventilation ?" Professor Chaplain's views met with unanimous approval. In part he said :

If fresh air is introduced into a room a corresponding provision must be made for the escape of foul air, for only as much air can be brought in as the ventilating shaft discharges foul air. The ventilating flue, therefore, should be large enough to insure the free circulation of the pure heated air through the room in the full measure and capacity of the cold air box and the heating apparatus. Uniform and reliable ventilation can only be secured by expensive appliances and fan machinery, which cannot be thought of for our ordinary and simple school buildings. But when it is asserted by those who have given the subject most attention that one-half of the diseases which afflict the human race can be traced directly to the breathing of impure air, and that children are many times more sensitive to atmospheric poison than adults, it is a crime for those who have charge of planning and constructing our school houses to neglect to provide them with at least some simple and economic means of ventilation.

On Heating Water by Steam.

One of the most familiar problems in dye houses and many other industrial establishments, says *The Locomotive*, to whom we are indebted for the accompanying illustrations, is the heating of considerable masses of water from comparatively low temperatures up to the boiling point, and the simplest and commonest way of accomplishing this end is by passing live steam into the



Heating Water by Steam.—Fig. 1.—Heating by Direct Injection.

tank which contains the liquid that is to be heated. This operation, in fact, is met with so universally that one would naturally suppose that the principles it involves would be thoroughly understood by every mechanic, and yet we find that such is not the case. It is by no means rare to find such tanks piped up for steam in a way which proves that the piper had no very clear idea of how the thing is done.

In arranging a tank for heating water or other liquids by steam, we have two general methods between which to choose. We may discharge the steam directly into the liquid to be heated, by means of a perforated pipe, as shown in Fig. 1, or we may lay down a coil of pipe in the bottom of the tank, as indicated in Fig. 2, and obtain the desired heat by conduction through the metal of the pipe. The arrangement shown in Fig. 1 is far more frequently met with than that shown in Fig. 2, probably on account of its greater simplicity. Sometimes, however, it is not permissible or desirable to discharge the steam directly into the contents of the tank—as when working with indigo dyes, for example—and in these cases the method shown in Fig. 2 must be adopted.

In either case it is of the first importance to have the steam pipes lie along the very bottom of the tank, in order to insure good circulation and a uniform temperature throughout the contents of the tank. We often find such tanks put in with the coils (or the perforated discharge pipe) running around the sides of the tank, just below the surface of the liquid contents, but a single glance at such an arrangement ought to show that it is radically wrong. At all ordinary temperatures water expands upon being heated and becomes lighter. If the heating pipe is in the bottom of the tank, the water that is in contact with the pipe will grow hot and expand and will rise toward the surface. An undercurrent of colder water will flow down along the sides of the tank at the same time to take its place, and so the process will continue, the coldest water always sinking to the bottom and coming into contact with the hot pipes that contain the steam, until the entire contents of the tank is heated to the boiling point. Now if the heating pipes had been placed near the top of the tank instead of at the bottom, the water in contact with them would grow hot and expand just as before, but being already at the top of the tank it can rise no further and the result is that it stays where it is and grows hotter and hotter until it boils, while the main body of the liquid below remains quiescent and almost as cold as it was at first, because there has been nothing to bring it in contact with the steam pipes. That is why it is wrong to put the heating pipes at the top of the tank. Placed at the top they give no circulation; while if placed at the bottom they produce a good circulation and the whole tankful of liquid is then heated uniformly and regularly up to the desired temperature.

Now, having decided which of the two methods shown in Figs. 1 and 2 will be best for the purpose in hand, the next question is how much steam will be required to bring the contents of the tank up to the boiling point? Here, too, we find that mistakes are easily made. It takes a great deal of heat to raise a ton of water up to the boiling point, and pipers very often greatly underestimate the quantity of steam that will be required. A rough rule, which gives pretty good results in general practice, is to allow 1 pound of steam for every 5 pounds of the water that is to be heated up to 212 degrees. For most purposes this will be found to be quite sufficient, but as the more accurate process is quite simple, we shall give that also.

Heat Given Out by a Pound of Steam at Various Pressures, in Condensing into a Pound of Water at 212° F.

Gauge pressure.	Heat units.	Gauge pressure.	Heat units	Gauge pressure.	Heat units.
Pounds		Pounds		Pounds.	
0	965	15	976	50	991
2	967	20	979	60	994
4	969	25	982	70	997
6	970	30	984	80	999
8	972	35	986	90	1001
10	973	40	988	100	1003

A pound of steam at atmospheric pressure, in condensing into a pound of water at 212 degrees F., gives out about 965 units of heat—that is, the heat that it gives out would be sufficient to raise the temperature of 965 pounds of water by 1 degree. If the steam were originally at a greater pressure than that of the atmosphere, it would give out a little more than this amount of heat, but the difference is not nearly so great as might be expected.

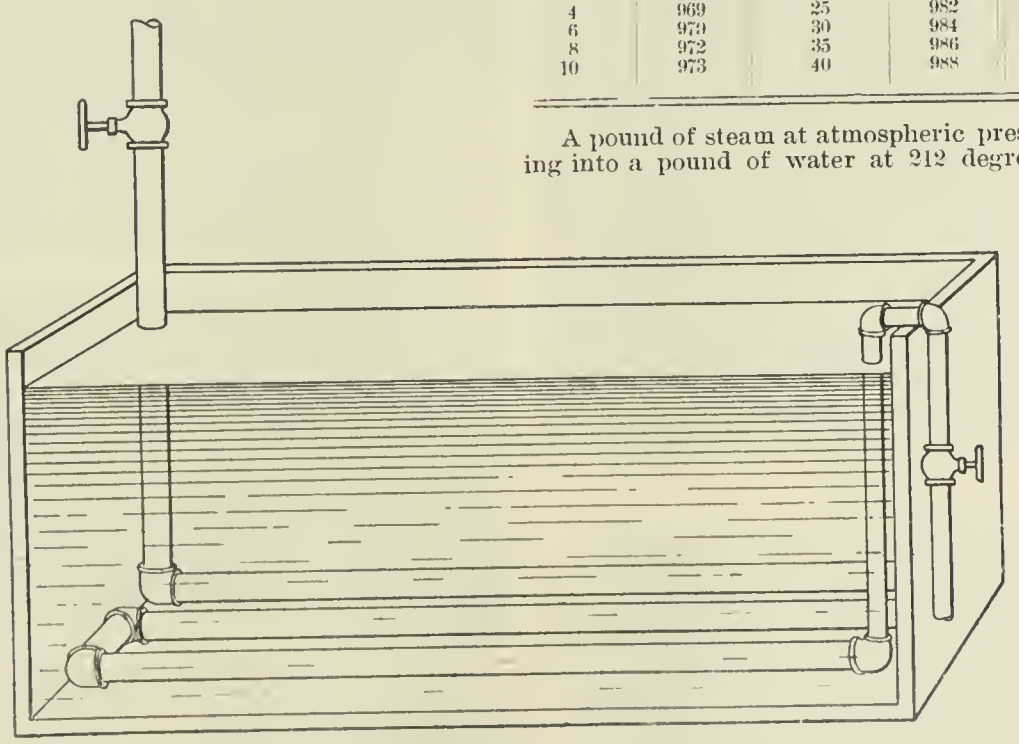


Fig. 2.—Heating by a Closed Coil.

Thus 1 pound of steam at 100 pounds gauge pressure gives out 1003 heat units upon condensing into water at 212 degrees, and this, it will be seen, is only about 4 per cent. greater than the heat given out by the same quantity of steam at simple atmospheric pressure. The number of heat units given out by a pound of steam, in condensing into water at 212 degrees is given for various gauge pressures in the accompanying table, which is based on data given by Clausius.

Now let us take a numerical example. Suppose our tank contains 7500 pounds of water at a temperature of 48 degrees F., and we want to know how much steam must be drawn off from a boiler carrying 70 pounds in order to heat this water up to the boiling point. Our rough rule of allowing 1 pound of steam for every 5 pounds of water would call for 7500 ÷ 5 = 1500 pounds of steam, or three-quarters of a ton; and while this result does not pretend to any great degree of accuracy, it is near enough to the truth to show how badly deceived a piper would be if he "guessed" that 100 pounds or so would be sufficient.

To calculate the amount of steam required with greater accuracy, we must first find out how many heat units we have got to supply to do the required work. The water in the tank is originally at 48 degrees F., and we wish to heat it up to 212 degrees. We must therefore raise its temperature 212 degrees — 48 degrees = 164 degrees. Now a "heat unit" is the amount of heat that is required to heat 1 pound of water 1 degree; and hence it would take 164 heat units to heat 1 pound of water from 48 degrees up to 212 degrees. But we have to heat no less than 7500 pounds through this range of temperature, and since every one of these pounds calls for 164 heat units, the total heat supplied must be 7500 × 164 = 1,230,000 heat units.

Having found out how much heat will be required, the next question is, How much steam at 70 pounds pressure shall we have to use to obtain this quantity of heat? By referring to the table we see that 1 pound of steam (at 70 pounds gauge pressure) will furnish 997 heat units and no more, and therefore to get the required 1,230,000 heat units we shall have to use 1,230,000 ÷ 997 = 1234 pounds of steam.

This process may be summed up in the following:

Rule—To find the weight of steam that will be required to heat a given body of water from a given temperature up to the boiling point, multiply the number of pounds of water in the tank by the number of degrees through which the water is to be warmed and divide the product by the constant that is given in the table, for the particular pressure of steam that is to be used. The result is the number of pounds of steam that will be required.

[If the contents of the tank is given in cubic feet or in gallons, instead of in pounds, multiply the number of cubic feet of water in the tank by 62.3 and the product will be the weight of the water in pounds, or multiply the number of gallons by 8⅓, and the product will be the weight of the water in pounds.]

The method of calculation here given is strictly accurate when the steam is blown directly into the liquid to be heated as in Fig. 1, but when the water of condensation is kept separate from the contents of the tank and is removed from the coils by means of a drip pipe as shown on the right in Fig. 2, the result obtained by the foregoing rule is merely a close approximation, unless the heating process is so regulated that the condensed water drawn off from the coils is always just at 212 degrees. If the condensed water so drawn off is below 212 degrees, as it may sometimes be when the water in the tank is still quite cold, the rule gives a result slightly too large. It is always very close to the truth, however, and its departure from strict accuracy in the case of Fig. 2 is due merely to the fact that in making out the table given above we have assumed that the condensed steam cools precisely to 212 degrees. If it should cool a trifle more or less than that, owning to its being drawn off from the coils before the water in the tank is fully heated to the boiling point, the results obtained by the rule will be in error by a correspondingly slight amount.

NOTES.

The plumbing and hardware firm of Dearborn & Greenwood, at Malden, Mass., have been dissolved, and the business will be continued by Mr. Greenwood.

W. H. Teemer & Co. have opened a plumbing establishment at 230 Fourth avenue, McKeesport, Pa.

James Donnelly has removed his plumbing establishment to the Farley Block on Main street, Boonville, N. Y.

The Lyman Water Circulating & Heating Company have been incorporated at Chicago, with a capital stock of $25,000, by James P. Whedon, C. S. Keown and Ralph E. Hatcher.

Reuben S. Bemis, City Inspector of Plumbing of Providence, R. I., recently gave a lecture on plumbing and drainage at a meeting of the Franklin Society of that city. In his lecture he stated that previous to 1894 the plumbing and drainage of buildings in that city had been done in accordance with the views of the owners regardless of correctness of design from a sanitary standpoint, and in many instances cases of typhoid fever or other diseases could be directly traced to the bad plumbing of buildings. He gave a detailed account and an explanation of the present law and its provisions for laying out plumbing work to avoid the troubles of the past. He also exhibited numerous drawings showing the defects commonly found in plumbing systems.

Robert Carlisle of the plumbing goods house of Thomas Gibson Company, Cincinnati, Ohio, gave a lecture on sanitary plumbing before the Cincinnati Chapter of Architects of that city.

Bids will be received at a special meeting of the Hoboken, N. J., City Council on December 15 for plumbing the new Armory Building.

K. L. Cowgill of Dover, Del., has been awarded the contract for plumbing the new building at the State College for Colored Students.

Since the law has gone into effect at Boston requiring that gas fitters shall pass an examination and take out a license a scarcity of gas fitters has been noticed owing to the failure of a number who have heretofore done gas fitting to stand the test.

The Board of Education of Mount Vernon, N. Y., awarded the contract for heating the new West Mount Vernon school building to W. E. Rois of Brooklyn for $3735. This is for the steam hot blast system, the equipment being that of the Buffalo Forge Company.

Chas. P. Stamm has opened a plumbing and steam fitting shop at 213 Market street, Portsmouth, Ohio.

Albert Lovely has opened a plumbing and tinning shop at West and Lovely streets, Southbridge, Mass.

Tyler & Bennett succeed Frank Tyler in the plumbing business at Albion, N. Y.

T. J. Clark of Floyd Township, Woodbury County, Iowa, has just completed the most extensive line of farm plumbing ever done in that section of the State. He has built a 50-barrel reservoir on an eminence a quarter of a mile from his house and feed yards, and pumps water into it from the valley below by wind motor power. From the reservoir water is conveyed to all parts of the premises, 2800 feet of pipe being used.

Besides furnishing the extensive sheet metal work for the remodeled Savoy Hotel, T. W. Corbett, New Haven, Conn., is reorganizing the plumbing system in the hotel. In the new Moses Building on Chapel street he has just installed a Bundy Steam Heating Boiler, which is now in use.

The journeymen plumbers of Washington, D. C., have appealed to the District Commissioners against the changes proposed in the plumbing regulations which would deprive them of representation on the examining board. They indorse the regulations requiring the examination of plumbers and the inspection of plumbing.

A consular report says that the development of Johannesburg, Kimberly, Natal and the mining and farming districts of British South Africa generally is calling for building materials in ever increasing quantities. Plumbers' supplies are said to be in especially active demand. As nothing of the kind is made in the country, the prospects for a good market for foreign manufacturers are favorable.

The Fowler & Wolfe Mfg. Company, Philadelphia, are sending out Fowler Radiators in such quantities as to tax their producing capacity to the utmost.

A large card is received from the Judson A. Goodrich Company, 120 Beekman street, New York City, bearing a transparent view showing the construction of the Water Seal Automatic Air Valve. The object of the card is to announce that the company have purchased the entire output of the New York Valve Company, and hereafter will be able to furnish on short notice Back Pressure Valves, Reducing Valves, Radiator Valves, Air Valves, Pump Governors, Damper Regulators, Steam Traps and Water Feeders.

Edward Gurney of Toronto, Canada, was one of the visitors of I. G. James, 48 Centre street, manager of the New York office of the Gurney Heater Mfg. Company, Boston, Mass, this week.

Deckert & Braconier are a new firm in the plumbing business at 22 South Seventh street, Fort Dodge, Iowa.

Nicols & Ryan of Appleton, Wis., have opened a branch of their plumbing establishment at Neenah.

The plumbing shop of P. J. Reaney, 1177 Fort street, Detroit, Mich., was recently visited by a slight fire.

The American Sanitary Ventilating Company have been incorporated at Butte, Mont., by Ed. D. Neill, Arthur

O'Brien, T. H. Kleinschmidt, C. B. Miller and August Fack of Helena and James H. Monteah of Butte, with a capital stock of $125 000. The company will manufacture, buy and sell sanitary devices and appliances.

W. H. Blanchard has been taken into partnership by W. H Hitchcock of Palmer, Mass., in his heating and plumbing business.

John H. Izett, Jessie F. Izett and Henry W. McGee have filed articles of incorporation with the Colorado Secretary of State for the Izett-McGee Plumbing Company, the capital stock of which is $5000. The company will carry on business in Denver.

A neat folder is received from the Judson A. Goodrich Company, 120 Beekman street, New York City, entitled "How We Came by the Wish Bones," referring to their Thanksgiving circular requesting good wishes for them and their line of high grade steam specialties. The explanation is in a pleasant strain, and leads one to suppose that the company had subsisted on a turkey diet for a considerable time in order to accumulate so many wish bones. For the gratification of our curiosity it was explained, however, that the wish bones were imported by the house who printed the circular. It further appears that in Europe there is a custom among the cooks in families and hotels, restaurants and other places to save wish bones and to sell them, there being a market for these articles where collectors can dispose of them.

W. M. Mackay, president of the American Society of Heating Engineers, attended the annual meeting of the American Society of Mechanical Engineers in New York this week as a guest of the society.

Francis Brothers & Jellett have transferred their New York office to 70 Trinity place, where S. A. Jellett has larger quarters and better facilities for attending to their growing heating and contracting business in this vicinity.

The workmen at the sanitary ware potteries at Trenton, N. J., are looking forward to the restoration at Christmas of the 12½ per cent. which was cut from their wages some time ago. The potteries are all running busily, and the manufacturers report steadily increasing demand for goods. The Western operative potters have decided to give up the idea of forming a uniform wage list, and will accept the 12 per cent. advance upon present wages offered by the Manufacturers' Union.

James McGuckin of the firm of J. McGuckin & Brother, plumbers, at 1023 Christian street, Philadelphia, Pa., died at his residence in that city Saturday, November 20, after a protracted illness. Mr. McGuckin was 60 years old at the time of his death and had been in business for 30 years in Philadelphia, and formerly was prominent in operation work in that city. Mr. McGuckin was never married.

A dispatch of December 2 from Cleveland, Ohio, states that the sewer pipe manufacturers, who were in session there for two or three days this week, with the object of forming a combination, adjourned without reaching an agreement. It was said that some of the big manufacturers who had been counted upon to support the movement had declined to do so.

Couch Exhaust Radiator Company, Chicago, have been incorporated, with a capital of $100,000, to manufacture Radiators and Railway Appliances, by Thomas B. McGregor, Frank G. Howser and Belle W. Barry.

John Mills has resigned his position with the Crane Company, New York, and will engage in the Heating and Supply business at Providence, R. I.

Edward T. Davis, one of the Republican nominees for Councilman from Ward Three, Springfield, Mass., is well known as treasurer and manager of the New England Plumbing Supply Company of Bridge street. He has been in Springfield nine years, coming from Providence, R. I. Mr. Davis is an Odd Fellow and a member of Hampden Lodge of Masons, Springfield Commandery, Knights Templar, and is a Shriner. He is also a veteran fireman director and one of the Membership Committee of the Y. M. C. A. This is Mr. Davis' first venture in politics. He owns considerable property in the ward, having recently put up two new buildings on Bridge street.

The Vance Boiler Works Company, Geneva, N. Y., have procured a handsome glass paper weight fitted with an adjustable and perpetual calendar, embellished with a cut of their unrivaled Heater, a brief description of its advantages and the names of the officers of the company. For the business man's writing desk it is a neat and useful souvenir.

The Humphryes Mfg. Company, Mansfield, Ohio, issue Catalogue H, bound in stiff cloth covers and containing 349 pages. The company are manufacturers of Iron and Brass Pumps for hand and power use. Brass Goods and Supplies for steam and gas fitters, Supplies for engine builders and water works, to which lines of goods the catalogue is devoted. Near the front of the book is a view of the buildings embraced in their extensive plant. The catalogue contains an index, cipher system, information concerning Pumps, figures and formulas, discount equivalents, &c. The book has been carefully compiled and is well printed on a fine quality of paper and contains illustrations and list prices

The Acetogen Acetylene Gas Generator.

The Acetogen is an apparatus for the generation of acetylene gas. It is intended for use in making illuminating gas on a small scale, as, for instance, for a single dwelling house or store. Much has been printed about acetylene gas, and our readers are doubtless aware that it is produced by treating calcic carbide with water in specially designed apparatus, the carbide being made by mixing finely ground coke and lime and fusing the mixture at a very high temperature in an electric furnace. It is but recently that calcic carbide has been produced on a sufficiently comprehensive scale to enable it to be readily purchased for gas making. The gas produced has a much higher illuminating power than ordinary city gas, 5 cubic feet of it being equal in illuminating value to 60 to 75 feet of the ordinary gas. Burners are therefore used with very much smaller tips. A dwelling is piped in the ordinary manner, and a gas generator is placed in the basement connected with the pipes.

The Acetogen is an automatic generating apparatus, which consists of a generating chamber, entirely surrounded by water contained in an outer chamber, above these being a gas holder, inside of which is a purifying chamber. Access to the generating chamber is by means of a removable, self sealing iron door. It contains a drawer provided with suitably arranged gratings for the carbide. Water is admitted through a valved opening from the outer chamber, and attacks the carbide from below. As the carbide is disintegrated the residuum falls into a drawer and is withdrawn therewith. Generation is controlled without the introduction of any mechanical device, by maintaining a water level in the outer or supply chamber higher than the grating in the generating chamber. The water, in seeking its level through the opening between the chambers, constantly tends to flood the carbide on the grating and is held back by the pressure of the gas, which is instantly generated by the water contact. When gas pressure exceeds that of the water, the latter is driven back into the outer chamber until it is below the carbide, when gas generation practically ceases. When pressure has been reduced by consumption of gas the water again attacks the carbide, and the operation is automatically repeated until the carbide is exhausted. Purification is accomplished by passing the gas through a large cooling chamber, inside the gas holder, causing it to circulate in contact with the water cooled walls, and finally to the outlet pipe, pure, dry and in condition for burning. Condensation is automatically cared for, there being no pet cocks to be opened and perhaps neglected.

In the construction of this generator the very great importance of maintaining in it a low temperature has been carefully observed. The overheating of the gas is due to causes which have been avoided in the Acetogen. Its safety is demonstrated by the fact that the Patent Device Committee of the Chicago Underwriters' Association signed a report containing the following statement: "We are satisfied that it is safe in the hands of ordinary inexperienced persons." The construction permits of the utmost simplicity, there being no mechanism to be deranged by use or corrosion, and the parts requiring manipulation have been reduced to a minimum. It can be set up by any careful mechanic who will follow the directions given. The Acetogen is the invention of Augustine Davis, and is manufactured by F. Cortez Wilson & Co., 239 and 241 Lake street, Chicago.

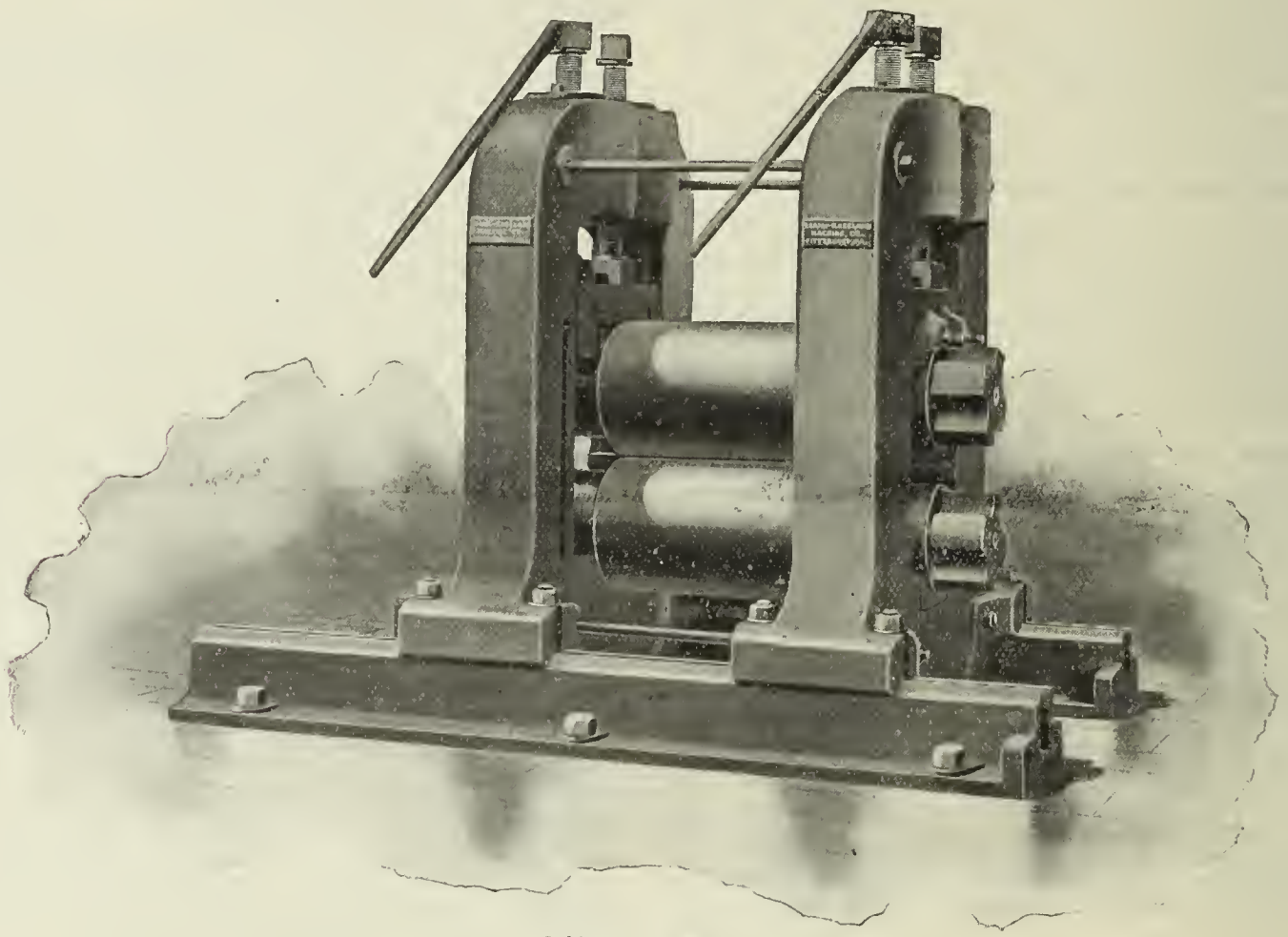
The Murphy contract for handling the garbage of Chicago was not consummated, and the elaborate scheme for burning it will not therefore be carried out On Monday of this week the matter was settled by the division of the city into four districts, in two of which contracts were awarded to Mulcaire & Burke, who will use the Merz reduction system, now operated in Milwaukee and St. Louis. Dowdle & Chamberlain get one of the districts and will use the Chamberlain reduction system, as operated in Detroit and some Eastern cities Hanrahan & Downey get the remaining district, and will use the Flinn reduction system, which is operated in Pittsburgh. The reduction plant in each district is to be built by March 1. The contracts awarded are for five years.

Snow storms and frost ushered in the winter this week. The advent of cold weather has stimulated the demand for seasonable goods in all parts of the country.

TIN PLATES.

Cold Rolling Mills.

We illustrate the latest idea in cold rolling mills, as manufactured by the Frank-Kneeland Machine Company, Pittsburgh, Pa., makers of rolling mill machinery. The rapid growth of the tin plate industry has called forth this class of machinery and the development of ideas has kept close pace with the demand. Cold rolling in the tin mill is one of the most important steps in the production of plates. A smooth surface free from "buckles" is most important. To secure this the rolls must carry a fine face, and be capable of accurate adjustment, and be held firmly in place. These requirements are secured by the quality of the rolls, massiveness of the housings, and the four top screws; by means of the latter, the rolls can be held perfectly parallel and are capable of the finest adjustment. These mills are largely used for cold rolling all classes of planished plates for stove pipe, stamping and taggers iron, also in brass and copper rolling mills. The above firm build special mills for cold rolling strip.



Cold Rolling Mills.

SCRAP.

The American Tin Plate Company, Elwood, Ind., have begun the erection of a two-story assorting building, 100 x 200 feet, which was made necessary by the increased output. The company have started up their new bar mill, and advise us that it is working very satisfactorily. They use a billet 6 inches square and 6 feet long and are doing good work. This mill is said to be one of the best arranged bar mills ever built, having a capacity for turning out a very large tonnage. It was built by the Robinson-Rea Mfg. Company of Pittsburgh.

The National Tin Plate Company of Monessen, Pa., have taken out a charter of incorporation, with a nominal capital stock of $1,000,000. This concern have had under erection at Monessen for some time a Tin Plate plant, which will be ready for operation some time early next year. Their capital stock will eventually be increased to $1,000,000. They operate a branch works at Anderson, Ind.

It is reported that the new Tin Plate works of the Laughlin Nail Company, at Martin's Ferry, Ohio, is to be an eight-mill plant instead of a six-mill, as originally intended. This will give the concern a total capacity of 14 mills.

The works of the American Tin Plate Machine & Mfg. Company, Canal Dover, Ohio, are reported to be running full day and night.

Ground has been broken at New Castle, Pa., for the erection of the new Tin Plate plant of the Shenango Valley Steel Company. The main building for this plant will be 1650 feet long by 100 feet wide, while there will be a second building 750 feet long by 60 feet wide. It will be remembered that the contract for these buildings was placed some time since with the Shiffler Bridge Company, while the rolling mill equipment will be furnished by Mackintosh, Hemphill & Co., also of Pittsburgh, and the engines by the Edward P. Allis Company of Milwaukee, through J. Weldman Murray, their Pittsburgh manager.

John Hamilton, Pittsburgh, Pa., manufacturer of Hamilton's Best Re-Dipped American Roofing Tin, is meeting with a very heavy demand for this brand of Plate. Up to December 1 the sales of this Plate have been nearly 50 per cent. larger than during the entire year of 1896. This certainly speaks well for these goods, and is the best evidence that they are giving satisfaction wherever used. Mr. Hamilton has under erection a Black Plate mill at West Newton, Pa., which will be ready for operation about January 1. It is a two-mill plant, having two hot mills and three cold mills, and will enable this firm to guarantee to their customers a superior quality of Black Plate right along.

At the annual banquet of the Llanelly Chamber of Commerce, held recently, Sir John Jones Jenkins, M.P., illustrated the change which has come over the Welsh Tin Plate trade in recent years by reference to the fact that in the previous week 58,000 boxes of Tin Plate were shipped from Swansea, and not a single box of this large quantity went to the United States. Ten years ago, said Sir John, this would have been looked upon as incredi-

ble. It showed, however, that new markets are opening out for Welsh Tin Plates.

Follansbee Bros. Company, Pittsburgh, Pa., advise us that they have increased the weights of their guaranteed high grade Roofing Plates, making them more valuable to the consumer. Thus Scott's Extra Coated now carries 47 instead of 46 pounds of coating per box, Triumph Old Method has 38 instead of 36 pounds, and Protection Old Process 40 instead of 36 pounds as heretofore.

The Lalance & Grosjean Mfg. Company's mills at Harrisburg, Pa., are running full in all departments. Three Tin mills and two Sheet mills are kept busy turning out material to supply the requirements of the company's factory at Woodhaven, Long Island. The November output of the Harrisburg plant was by far the largest in its history.

Aurora Shears and Punching Machines.

The hand machines illustrated herewith are new machines which have been designed for the use of manufacturers of specialties, carriage makers, blacksmiths and others whose work does not call for such constant use as would justify the application of power in some form. They are the result of many years of experience in the manufacture of hand shearing and punching machines by D. H. Smalley & Co. of Aurora, Ill.

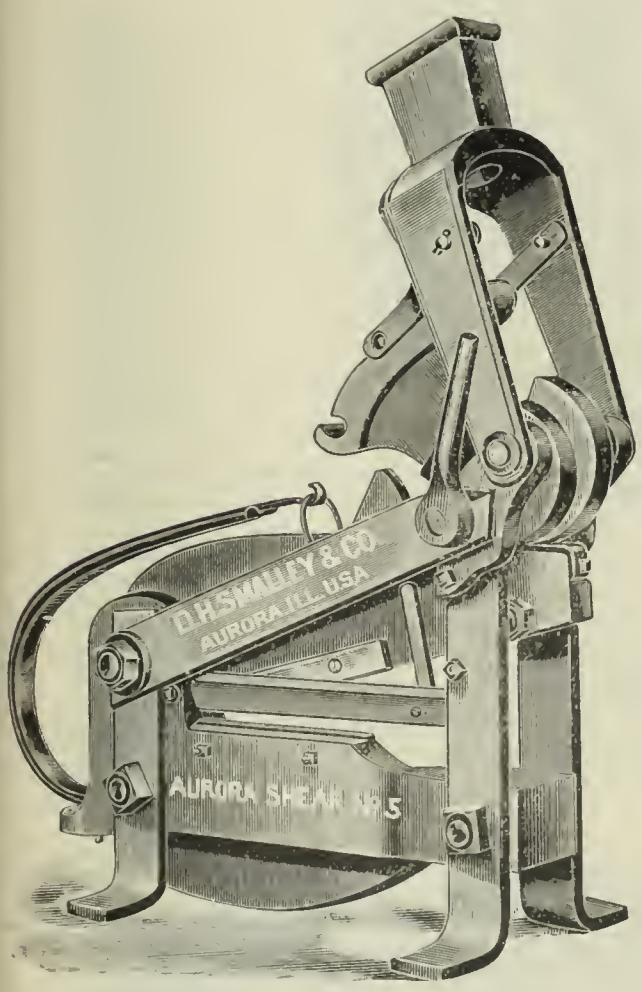


Fig. 1.—Aurora Shear.

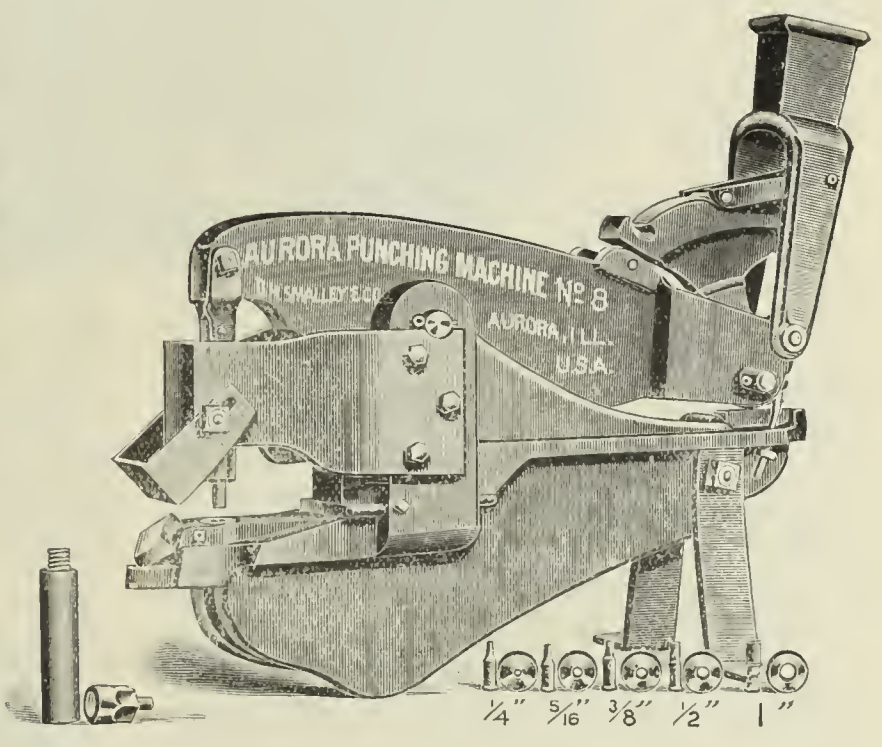


Fig. 2.—Aurora Punching Machine.

The Aurora shear, shown in Fig. 1, is a very compact tool, built for heavy service and supplied with a powerful leverage. Friction is reduced to the minimum. It will be seen by reference to the cut that all adjustments are quickly and easily made. The work is in plain sight. The piece to be sheared is held level on the knife by a bar holder, which is always in place ready for use. This shear cuts cold iron 1 inch square or 1⅛ inches round and flats in proportion up to 8 inches in width, at one movement of the cam.

The Aurora punching machine, Fig. 2, is adapted to general work, and punches angle iron up to 3 inches by 3 inches by ½ inch. It will punch a ½-inch hole in ½-inch iron to the center of 12 inches. No adjustment of dies is necessary, as the dies and punches are self centering. Hence no time is lost in fitting up for desired changes. The plunger moves perpendicularly in a long perfect guide, making it possible to punch metal of greater thickness than the diameter of the punch without injury to the latter. A smaller machine of the same general construction is made which takes angle iron up to 2½ inches by 2½ inches by ⅜ inch and punches ½ inch holes in ⅜-inch iron to the center of 5½ inches.

All arbors and main bolts in both shears and punching machines are of steel and case hardened. The system of compound levers which is used makes operations comparatively easy on the heaviest work.

Air Ship for the Klondike.—Hiram S. Maxim, who holds the office of superintendent of construction of the Atlantic & Pacific Aerial Navigation Company, announces that the company have in course of construction an air ship which is expected to make a trip to the Klondike region next spring. Mr. Maxim describes the apparatus as follows: "When everything necessary is on board the ship will weigh 5000 pounds, and we shall take on board about 1 ton weight of passengers and provisions. The space occupied will be 106,000 cubic feet. The propelling power will be a 16 horse-power naphtha engine, which will be made out of aluminum as far as that metal can be used, and will weigh complete 900 pounds. The gasoline will be stored in tanks in the cases, which will contain a sufficient quantity to drive the vessel around the earth without replenishing the tanks. The skin of the ship will be double and the intermediate space will be filled with hydrogen gas. This gas will be confined in separate compartments and will be in the upper part of the cylinder and in the cones."

An advance of 10 per cent. has just been ordered by several of the leading manufacturers of rubber goods in the prices of most of their products. The advance is understood to be the result of concerted action by an association recently formed, to be known as the Mechanical Rubber Manufacturers' Association. It is attributed priamrily to the higher prices of raw material, it being estimated that nearly all grades of rubber used by the mechanical rubber manufacturers have advanced 33⅓ per cent. in value in the past 12 months. The principal explanation for this advance is the enormously increased demand for rubber for bicycle tires. The articles mainly affected by the present advance are belting, packing, hose and other similar goods.

It is calculated that nearly $14,000 worth of electricity is expended nightly in New York City for illuminating purposes. By a late calculation there are 1,030,468 electric lights, both arc and incandescent, in use in the city, with an estimated total candle power of 50,000,000.

Returns published by the Ohio Secretary of State show that 1135 new enterprises were incorporated in that State during the past year. The total capital invested in these enterprises was $73,381,020, the largest proportion being in building and loan associations, after which come manufacturing concerns and railway companies.

A movement is on foot to establish a permanent exhibit of California products in New York City.

Statistics which have just been issued of the production of the Prussian mines during 1896 give an output which is 71,058,119 tons greater than that of the previous year, while the value was $17,502,000 higher. The increase was most pronounced in pig iron, but spelter, lead, copper and silver also showed substantial gains.

STOVE TRADE NOTES.

Dustless Buildings.*

BY C. J. WOODBURY, BOSTON, MASS.

The increased hight of office buildings, rendered possible by what Otis Tufts patented as the vertical railway, while bringing to their occupants relief from the noise of the streets and affording comfort by extending above the fly belt, which is as well defined as the snow line on a high mountain, also exposes the occupants to the fine dust which pervades the whole structure and which the other salutary conditions of the building render more prominent. The modern method of heating and ventilating such a building is by means of a blast of air drawn down a flue, warmed and forced through the building in such quantities that four times the volume of the building is frequently circulated through the rooms each hour.

This method of heating, although a more efficient application of radiating surface for heating the air than by direct radiation in rooms, can be managed with far less expense for attendance, repairs and fuel, and provides the sanitary requisite of ventilation without cold drafts, yet this apparatus distributes large amounts of dust through such a building, and in a city using bituminous coal under the average conditions there is a fine carbon dust which is especially obnoxious, impairing drawings, books, delicate mechanism and whatever may be injured by the shower of fine, impalpable dust, which produces black indelible smooches whenever touched. This carbon dust is always an annoyance and at times a serious matter.

The writer undertook to abate the difficulty of dust in a building of nearly 500,000 cubic feet capacity, through which 26,000 cubic feet per minute was usually blown, for heating and ventilation. The outside air used for this purpose was drawn down a flue 37 square feet in cross section and reached a velocity of 700 feet per minute. The means taken to remove the foreign substances from the air was by use of cotton cloth filters so arranged that the air should approach the fabric at an acute angle by which the momentum would carry these particles beyond a point where the element of air under consideration would pass through the filter and the particles of dust would be carried by the place and, striking the cloth at a lesser angle, tend to glance off and be carried to the bottom of the filter, rather than to clog the interstices in the fabric. The area of the filters being larger than that of the flue, the rate of filtration was inversely slower than the velocity of the air down the flue.

The means by which this was accomplished were very simple. A timber frame, divided by partitions into fine rectangular openings, was placed at the top of the flue, and under each opening was placed a bag whose top was attached to a light wood frame slightly larger than the opening, making a tight fit, so that the air entering the flue must pass downward into these bags, which were over 30 feet in hight. An arrangement of guides, ropes and pulleys enabled the bags to be raised and lowered by a person at the bottom of the flue. The bottoms of the bags were made open, and closed with a drawing string, and hoops kept the lower portion distended. An arrangement of lines extending along the sides from end to end facilitiated turning inside out and back again when they were being cleaned. The whole of the mechanical arrangement is fully described in United States patent No. 589,772. These bags were square at the top, where their combined area equaled that of the flue, but soon diminished to a cylindrical section, occupying about 40 per cent. of the space, thus affording ample clearance for the exit of the air passing through the fabric.

The area of the flue was 3¾ per cent. of that of the bags, and while the air passed down the flue at a velocity of 700 feet per minute, it passed through the fabric at 26 feet per minute. From ½ peck to 1 peck per month of fine dust was gathered from the bags. The efficiency of the device was tested by placing freshly painted boards at the bottom of the flue before the installation of the apparatus, and then giving another coat of paint after the apparatus was in service. In the first instance the fresh paint collected fine dust until it resembled fine sandpaper and in the second the paint dried with a smooth surface. In several of the offices split laps of absorbent cotton were placed in various parts of the building before and after the bags were in service, and one set was covered with fine particles and the other was free. The change was not a notable one at first, owing to the large amount of dust in the flues, but much of this was removed by running the blower at a very high rate of speed and afterward removing the registers and washing them and the flues as far as could be reached. The device has been solely under the care and management of the men employed on the engine and boilers, and has served its purpose in rendering a building free from dust caused by the ventilating system.

* Presented at the New York meeting of the American Society of Mechanical Engineers, Nov. 30–Dec. 3, 1897.

Cornelius C. Lent.

The stove trade of the country has lost another veteran member in the death of Cornelius C. Lent, president of the Peekskill Stove Works, which occurred at his home in Peekskill, N. Y., on Friday, November 26, after an illness of several months. Mr. Lent was one of Peekskill's foremost and most respected citizens, and his life's history is part and parcel of that place. He lived in Peekskill for more than half a century and was identified with its business interests, its social functions, its religious centers and its fraternal orders. He was born May 9, 1826, at Continentalville, a few miles north of Peekskill, being the son of Godfrey Lent, a farmer. He was educated at the district school, and when 18 years of age he went to Peekskill, apprenticing himself to learn the trade of molder to Taylor & Flagler, who at that time were leading stove manufacturers. He proved an apt pupil, and not only learned the art of molding, but mastered the stove business in general, becoming a skillful mechanic. Some time later he took a position as pattern maker with the National Stove Works. In August, 1865, he embarked in business with the late Isaac T. Montross, Alonzo B. Pollock and Peter Staats, the firm name being Montross, Lent & Pollock. With a capital of $12,000 and 22 employees they began business life in a building on South Water street, then known as the Peach Orchard Foundry, and later occupied by the I. J. Baxter Iron Foundry and now owned by Uriah Hill, Jr. In 1871 the firm purchased from Mr. Hill, then president of the Union Stove Works, the lower dock property, said to be the most valuable water front to-day in Peekskill, giving partially in exchange their Water street property. In 1878 Mr. Pollock died and the firm became Montross & Lent. On July 5, 1887, Isaac T. Montross retired and the business was reorganized under the name of the Peekskill Stove Works, with Mr. Lent as president. Mr. Lent's life work was not confined wholly to the stove trade, as he was prominently identified with other local interests. In 1880 he was elected President of the village, but he declined a renomination, and this was the only occasion on which he occupied office. He was a trustee of the Peekskill Savings Bank, a member of the Peekskill Board of Trade and a prominent Odd Fellow, being for more than 30 years a trustee of the Grand Lodge of the State of New York. The funeral services were held at 2 o'clock on the afternoon of Tuesday, November 30.

A New Gasoline Stove.

George M. Clark & Co., 72 to 76 Lake street, Chicago, are bringing out a new gasoline stove for the season of '98 which they are confident will surprise the trade. They are keeping the details of its construction secret for the present, except so much as they tell in their double page advertisement in this issue. The stove can be put in full operation in 15 seconds from the time of striking a match, and they guarantee that it is absolutely free from all danger. The manufacturers have devoted more than three years to experimenting with this stove, working out a definite purpose, which they have finally accomplished. When George M. Clark & Co. grow enthusiastic over something the trade may rely upon it that a great deal is to be expected. The reputation of the house is so well established that their announcement cannot fail to be received with respect. Our readers will be given a full description of the new stove in due time. Geo. M. Clark & Co. are greatly enjoying the fine manufacturing facilities secured when they removed their works to Harvey, Ill. They find great convenience and economy in having all their work done on the ground floor. The advantages in receiving materials and shipping stoves by rail immediately at the factory have proved to be what they had an-

ticipated." Taking the whole enterprise, however, the benefits of the removal from the heart of Chicago which have already been realized are far greater than expected.

The Glenwood Patent Indicator.

The popularity of oven thermometers makes it of interest to study the construction of these devices. Through the courtesy of the Weir Stove Company of Taunton, Mass., we are enabled to present an illustration of the Glenwood patent indicator which they use and show some of its constructive features. Fig. 1 is a front view of the dial and Fig. 2 is from a photograph of the inside of an oven door, and brings out prominently the mechanism of the indicator. The indicator, it will be seen, consists of an irregular and broken ring of cast iron, fastened at one end by a screw to a cast plate which holds it rigidly in place. The ring is offset in a way to give bearings for the interior brass rods, shown plainly in Fig. 2. These rods are carefully made and adjusted by means of set screws, the ends of which are visible. The free end of the cast ring is connected by a thin strip of steel to a sort of compound lever, which actuates the hand that shows on the front of the indicator. The top of the hand, as shown in Fig. 1, is at the extreme left of the dial. As the temperature in the oven rises the brass rods increase in length and the free end of the cast ring is drawn out. The movement thus obtained is multiplied and the point of the hand swings to the right of the dial, according to the heat of the oven. The feature of this arrangement is its extreme simplicty, and we understand from the Weir Stove Company that the thermometers are giving most excellent results and are greatly appreciated by the trade. The cast iron ring merely serves to hold the brass rods and convey the motion to the steel strips and the indicator hand.

The Glenwood Patent Indicator.—Fig. 1.—Indicator Face.

Fig. 2.—Back of Indicator, Showing Mechanism.

ODD PLATES.

A meeting of the Western Furnace Manufacturers' Association has been called for Tuesday, December 21, in Parlor L 38, at the Great Northern Hotel, Chicago, to take action on the resolutions passed by the Eastern Furnace Association at their September meeting.

The Excelsior Steel Furnace Company, 38 and 40 West Monroe street, Chicago, are making arrangements to install a die making and repairing plant, and after January 1, 1898, expect to make and repair all of their own dies. In making furnace fittings the company operate over 500 dies and punches, and this number will be largely augmented during the coming year, as their line of Furnace Piping and Fittings is to be materially increased.

It is reported in the trade that some prominent Stove manufacturers are making arrangements to add to their line the manufacture of Hot Water Heaters and Steam Boilers for house heating. They are arranging to be ready for the spring trade.

The Richmond Stove Company of Norwich, Conn., have just purchased from the Norwich Saving Society the building adjoining their works on the south, covering 119 x 95 feet. In addition to this they have secured 224 feet of ground with the buildings thereon, located on Lower Thames street, also what is known as the Burt Building, which connects the two properties. These additions, we understand, will give the company a frontage on the river of 1000 feet. The improvements noted have become necessary in order to provide room for the company's increasing business, and it is stated that the foundry is melting daily more iron than at any time during the past two years.

A. W. Glessner, president of the Excelsior Steel Furnace Company, Chicago, departed December 1 on his annual winter vacation, and this season will penetrate the fastnesses of the Rocky Mountains about 500 miles beyond Denver, and incidentally will visit Salt Lake City, Ogden and other Utah points before returning East for the holidays.

The Michigan Stove Company received in their mail a few days ago a letter from one of their customers, a firm in Minnesota, who have been pushing the Front-Flue Oak Garland. The substance of the letter is that the results have been highly satisfactory, not only to the Minnesota concern but also to those to whom they have sold the stoves. After referring to the gratifying results the firm state that "the Front-Flue Oak Garland is the only

Stove we have ever had which is a full base Heater and can be used for any kind of fuel. The Stove is an unqualified success."

Henry H. Guernsey, New Haven, Conn., has been making a specialty of the Royal Hot Air Furnaces made by the Hart & Crouse Company, Utica, N. Y., and is enjoying a good trade. He has recently completed a number of heating contracts and is now engaged in the installation of 11 more Royal Furnaces for other parties.

Since the quarantines have been raised in various localities of the South the Standard Stove Works of Birmingham, Ala., have been rushed with orders. The demand comes from all points and shipments are being made as rapidly as possible.

The Girard Stove & Foundry Company of Youngstown, Ohio, report a good demand for their products and state that business is growing rapidly. Their trade is covering a more extensive territory than heretofore and the outlook is considered gratifying.

Some time ago Isaac A. Sheppard & Co., Philadelphia and Baltimore, got out a little book about house warming, which they called "Hints About Heating." It contained something more than hints, and was a clear headed elucidation of the theory of hot air heating for all buildings. It contained some tables of dimensions and proportions, which architects and builders found very helpful. Of course the book did not cease until it had also brought forward the fact that the Paragon Furnaces made by this company completely filled the bill of specifications which the book laid down. This book, we understand, has been adopted as a text-book in the architectural school of the State University of Illinois, at Champaign. The company have in press a third edition of the book, thoroughly revised and greatly enlarged. The new "Hints About Heating" will be in two parts, which may be had bound either separately or together. A great deal of interesting information is found in both parts about heating and about Paragon Furnaces. The new edition will have a handsome cover, especially designed for it.

Terstegge, Gohmann & Co., with main office at Louisville, Ky., and works at New Albany, Ind., are favoring their friends in the trade with an eight-page folder, the covers of which are embellished with a design humorous in character. A man of grotesque figure is seated in a chair busily engaged in reading. His legs are stretched at unusual length, and upon his feet are boots of mammoth size. The sole of each boot carries the words "Three sizes," while perched upon each toe is a chicken minus all but the tail feathers and with wide stretched mouth. One inscription on the cover says that the outside has nothing to do with the inside, and the reference to what the man is reading says, "He thinks it is interesting. For particulars see inside." On opening the covers of the folder we find illustrated descriptions of the Mystic Anchor Parlor Stove, adapted for burning hard or soft coal or coke, and offered in three sizes; the Torrid Anchor Fancy Cannon Air Tight, intended for burning the same kinds of fuel, and the Retort Anchor Air Tight Cannon, for coal or coke, also made in three sizes. These, the manufacturers state, in connection with their Regal, Acme and Giant Anchors, illustrated in supplementary catalogue No. 28, "present an unparalleled line of air tight heaters."

Mr. Edison's invention for crushing low grade iron ores and extracting the metal by means of magnets has lately been attracting a great deal of attention in all parts of the country, and one of the latest articles on the subject is that which appears in the Troy *Times* of November 23, the author being M. L. Filley, the well-known Stove man of that city.

It is stated that Messrs. Lowman having sold their interests in the Sheffield Stove Works, Sheffield, Ala., intend to start another Stove manufactory in that place as soon as suitable buildings can be secured.

Frank A. Goetz, for the past 12 years in the service of the Bridge & Beach Mfg. Company of St. Louis, Mo., died November 20 in the thirtieth year of his age. The company in announcing his death state that three years ago his health began to fail and he was called in from Southern Missouri, which territory he was covering, and placed in charge of the city trade, where the work was less difficult. On November 18 he was about the city visiting his customers as usual, but on the 19th he was seized with an attack from which he never rallied, and died just after midnight of the 20th. Mr. Goetz entered the service of the company when he was 17 years of age, and from the start showed an unusual aptitude for business. This trait, coupled with an earnest desire to do his full duty faithfully and conscientiously, caused him to fill every position to the entire satisfaction of his employers. His capabilities soon advanced him to the position of traveling salesman, and his uniform courtesy and his straightforward dealings gained for him the esteem and high regard of the trade in his territory of Southern Missouri, his associates in business and all who knew him.

Frank M. Gies, a director in the Co-operative Stove Company, at Black Rock, Buffalo, N. Y., died on the afternoon of November 22 after an illness of less than two days. He leaves a widow and seven children.

The Delta Double Heater is a stove which is finding a good demand at 239 Water street, where Manager John P. Ley of the New York office of Charles Noble & Co., Philadelphia, is bringing it to the attention of the trade. The Stove is of the round base burner type, arranged to take an air current from the floor and heat it and pass it from the heater by means of a pipe to a register in the ceiling into a room above, this type of Stove being very popular in old buildings in some localities.

The Mason & Davis Company of Chicago, Ill., have opened a salesroom in the Townsend Building, room 1001, at 1123 Broadway, New York, under the management of A. J. Eickmeyer, who is well known to the Stove and heating trade from his long connection with it. The company will make a specialty of their Combination Coal and Gas Range, and those interested in such goods will find an attractive exhibition at the headquarters.

The Charter Oak Stove & Range Company, St. Louis, Mo., advise us that they are now making the Grand Charter Oak in both Stove and Range form, with and without reservoir, for all kinds of fuel and in various sizes. This Stove heretofore was made in the Stove form only, but the trade called for it in Range form, hence the addition.

The heating department of the Ringen Stove Company, St. Louis, Mo., have just placed in position in the Coliseum, St. Louis, an extensive heating plant, which was tested on the 29th ult. The Coliseum is arranged to seat between 11,000 and 12,000, so that some idea of the immensity of the building is thus obtained. The building contains over 5,000,000 cubic feet of air space. At the test above referred to the building was heated from 20 to 65 degrees in four and one-half hours, or exactly 10 degrees per hour. The plant consists of four American Blowers, being coupled in pairs and operated by one engine. The contract was one of the largest ever placed, and the heating department of the Ringen Stove Company are to be congratulated on the excellent test which their work has just passed through.

The following story was lately told by a distinguished scientist: A meteorite which fell on a farm in America was claimed by the ground landlord, as his lease reserved all minerals and metals. The tenant objected on the score that the article was not on the property when the lease was executed. The landlord then claimed it as flying game, but the lessee pleaded that the thing had neither feathers nor wings, and claimed it as ground game. But while the dispute was going on the customs officers seized the meteorite, on the ground that the revenue had been defrauded by its introduction into the country without payment of duty.

A cable dispatch from Berlin, Germany, states that the Government naval bill to be presented shortly to the German Reichstag provides for a total fleet of 19 sea going iron clads, 8 coast defense iron clads and 42 cruisers, an increase of 5 sea going iron clads and 9 cruisers. The additional expense involved is $39,270,000, the amount to cover seven years, by which time the new war ships are to be completed.

A dispatch from San Francisco, Cal., reports that the Rothschilds, through the San Francisco house of Liebes & Co., are about to enter the Alaska trade. Four steamers are now being built for them by W. H. Brick & Co. of the California Machine Works. These steamers are being constructed in sections, and when completed will be sent to Dutch Harbor, near Unalaska, to be set up. Four barges are also being built by the firm in sections, and will likewise be put together at Dutch Harbor. All of this work is being done for the Alaska Exploration Company, who were recently incorporated with a capital of $1,000,000, by the Rothschilds and other capitalists. Besides a general transportation business, the new company will establish trading stations and thoroughly explore the gold bearing country in Alaska.

An evidence of the return of agricultural prosperity is presented by the fact that scores of abandoned farms in Eastern Pennsylvania, which have not been cultivated for several years, have recently been rented and occupied, and to day it is reported that few of these properties remain idle In Berks County alone over 100 such farms, ranging in size from 10 to 75 acres, have lately been taken up, and the price of land has increased an average of 15 per cent. It is predicted that by next spring the "abandoned farm" will be entirely a thing of the past in that section of Pennsylvania.

SHEET METAL WORK.

SLATE AND COPPER ROOFING ON FIRE PROOF BUILDINGS.—IV.

BY WILLIAM NEUBECKER.

COVERING STONE CORNICE AND FORMING GUTTER OVER SAME.

In Fig. 18 is shown the method of protecting the exposed part of a stone cornice, over which a gutter is formed under a mansard roof. A is the stone cornice, B the sheet copper forming the molding, with a lock at P, covering the stone work, with a beaded edge at F, and fitting into the square fillet of the stone cornice A. One-half inch round holes are drilled into the stone cornice at

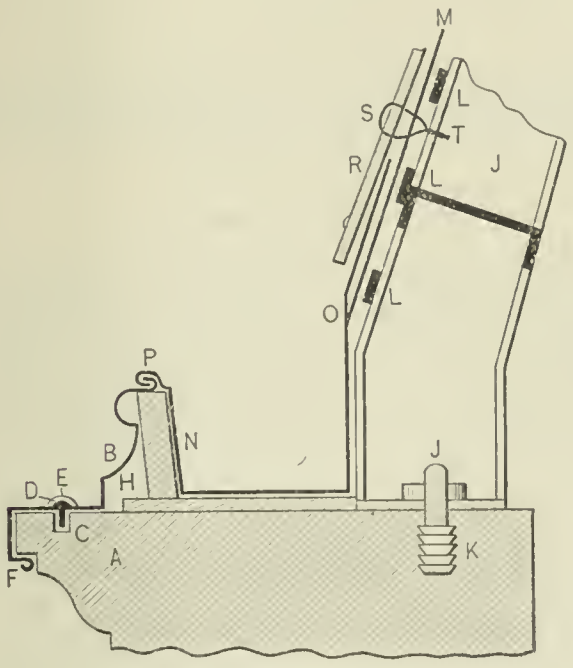


Fig. 18.—Section through Cornice

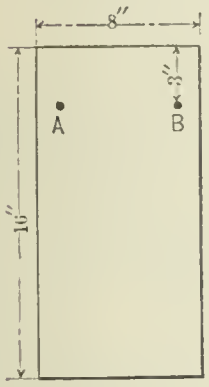


Fig. 19.—Slate Punched for Nails.

Fig 20.—Slate Punched for Wire Fastenings.

C at intervals of 2 or 3 feet and plugged with lead. Then the copper covering is nailed with brass nails into the plugged holes, as shown at D, and a concave copper cap, E, soldered over the nail heads.

In the previous chapters the method was given of fastening slates to porous terra cotta, but on some buildings having mansard roofs terra cotta is not used, the slates being fastened to corrugated iron covering as follows :

FLASHING AND SLATING ON CORRUGATED IRON COVERING.

Let J J in Fig. 18 represent the iron rafters fastened to the stone cornice at K, having iron laths L L L bolted or riveted to the rafter. On these laths the corrugated iron M is bolted. In this connection it is proper to remark that the corrugated iron should be galvanized and painted with two coats of good metallic paint before it is applied.

The wooden gutter lining H is now laid, after which the copper lining N is locked into the lock P and flashed over the corrugated covering as at O. To avoid any electrical action between the galvanized iron and copper a thick layer of two-ply asphalt paper should be laid between the copper and galvanized iron covering. The slating R is now laid, being fastened by means of copper wire 3-32 inch thick drawn through the slate and corrugated iron and twisted at the back with hand pliers.

In Fig. 19 is shown a diagram of an 8 x 16 inch slate, showing the two holes, A and B, which are used to nail slates to the boarding, terra cotta or fasten with wire.

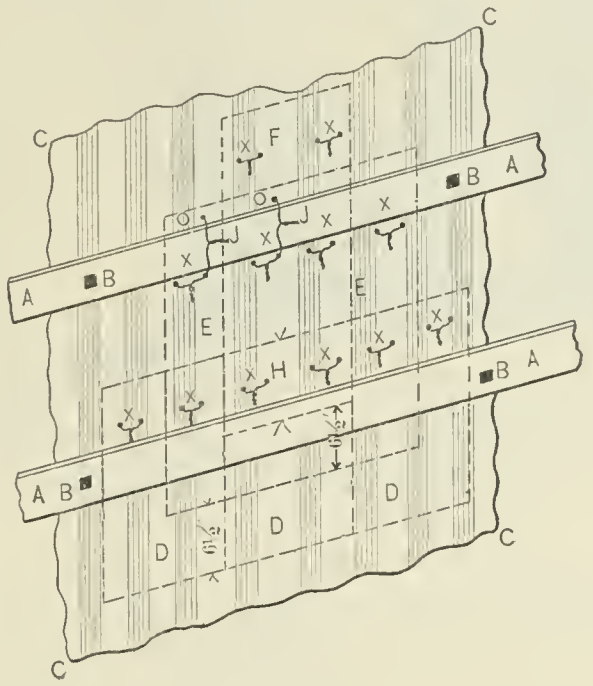


Fig. 21.—Back View of Slate Fastened to Corrugated Iron.

Some mechanics, however, use double holes to fasten with wire, as shown by C D and E F in Fig. 20. Slates are usually punched with the hand hammer, but the writer would suggest using a machine for punching slates, because the holes are almost the same as if they were drilled, while with a hand hammer the slates scale around the hole punched, leaving merely a shell.

Fig. 21 is a rear view of a mansard roof covered with corrugated iron, showing the method of twisting the wires on the inside. Let C C C C represent the corrugated iron covering, fastened to the iron laths A A, A A, by means of the bolts B B, B B.

Let D D D represent the first course of slates, fastened by means of copper wire, twisted on the inside, as shown at X X X, &c. E E represent the second course of slates, fastened in the same manner, laid 6½ inches to the weather (for 8 x 16), while F is the third course, laid the same amount to the weather, thereby overlapping the wires on the first course as much as is indicated by H. On the second course of slates E E the wires come under the iron laths A A. It is sometimes the case that the wires will come directly on the lath or other structure, in which case the hole would have to be punched to suit the conditions, as at O and O, and twisted as at J and J. When fastening slates to corrugated iron two persons are required, the mechanic on the outside and helper on the inside. By means of chalk and line the base line is snapped; the slate, which had been previously punched, is held in position by the slater, and by means of a long slender punch the size of the holes in the slate (⅛ inch) holes are punched through the corrugated iron, the wires bent U shape, passed through

the holes just made, and then twisted by the helper on the inside. It should be understood that it takes longer to describe the method of fastening than it does to put on the slate.

LAYING COPPER VALLEYS.

In Fig. 22 is shown an internal angle in a hipped roof, commonly known as a valley. When the roof is of slate, after the gutter is lined the valley is laid before the slating is commenced. Let A A represent the roof boards, B B the hip ridge and C C the copper valley, 7 inches wide each way, fastened to the roof by means of the cleats E E E E. A water lock, D D, is bent on each side of the valley, which prevents the snow or rain from getting under.

Fig. 23 shows the method of making a cross seam in a valley, the water flowing in the direction of the arrow E.

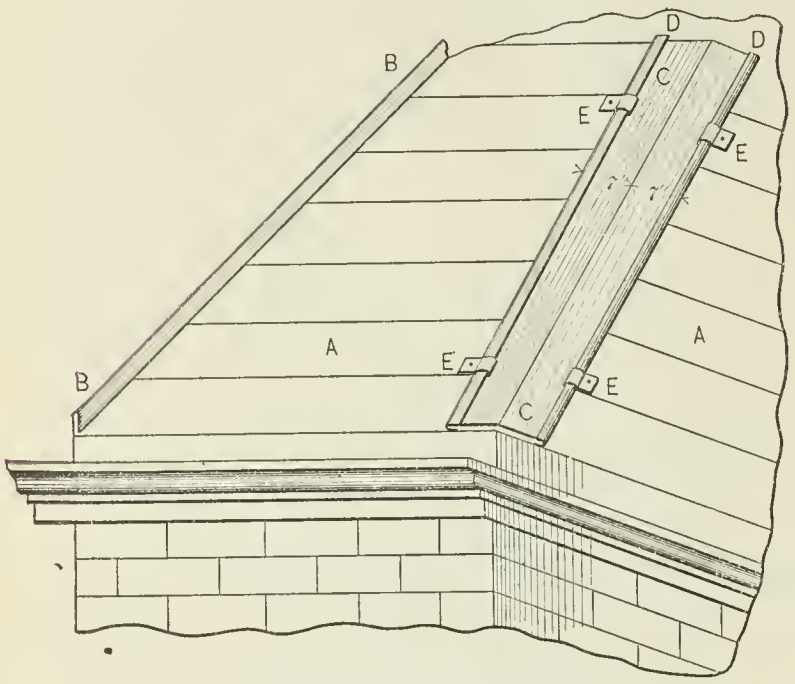


Fig. 22.—Laying Copper Valley on Roof.

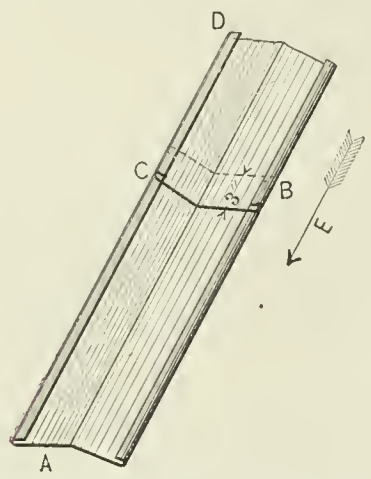


Fig. 23.—Overlapping Cross Seam in a Valley

Let A represent the lower piece and D the upper piece. The upper piece D will overlap the lower sheet A about 3 inches, as shown at C and B. Three inches of lap is sufficient to prevent the entrance of water, as the cross seams are not soldered, so as to allow for the expansion and contraction of the copper.

FLASHINGS.

The Tin shop of F. W. Gleason & Co., in the Savings Bank Building, Hyde Park, Mass., was damaged by fire on November 29.

The Mississippi Valley Roofing Company have recently been incorporated at St. Louis, Mo., with a capital stock of $20,000, by H. L. Block, R. E. Carr and P. S. Marquis.

The M. W. Powell Company, 926 and 927 Marquette Building, Chicago, Ill., send out with their compliments a little vest pocket book giving specifications for different kinds of gravel and composition roofs. The latter half of the little volume is left with blank pages for memorandum purposes.

A Sheet Metal Calendar.

Friedley & Voshardt, 194 and 196 Mather street, Chicago, manufacturers of architectural sheet metal ornaments, are distributing to their customers very tasteful wall calendars of which the accompanying cut is a good illustration. They are 7½ x 11 inches in size, made of heavily embossed steel, electroplated in copper. The cards for the perpetual calendar are held in a pocket in front. The firm are making special efforts to introduce sheet metal for ornamentation in work of this character.

A Sheet Metal Calendar.

They are making embossed sheet metal settings for mirrors and ornamental sheet metal work for hat racks and other purposes to which it can be adapted.

The Supply of Asbestos.

European manufacturers of asbestos goods are supplied, says *Engineering* of London, from four sources—viz.: 1. Canada, whence the asbestos is white, silky, very unctuous, having supple fibers from 5 to 25 mm. in length; of all varieties it is that which spins the most easily. 2. Siberia, whence the mineral is yellowish, some species being of a straw yellow. The fiber is less flexible and more woody, but stronger, than the Canadian, which it resembles in length; large masses of long fiber mineral being, however, rarer. 3. The Cape of Good Hope asbestos has a characteristic blue color. It occurs in larger masses than either the Canadian or Russian, and its fiber is generally longer and stronger. In spinning or other manipulation, however, it is difficult to handle, a good deal of the fiber being reduced to powder. 4. In Italy there are different kinds of asbestos, but generally they are little adapted to spinning. There are some long silky fibers of little resistance, employed for gas furnaces; others are very short and fit only to make heat retaining coverings.

Tests of Flooring Material.

The Boston *Journal of Commerce* gives the following interesting results of a thorough and careful investigation recently carried out as to the comparative durability of different flooring materials. In the tests an ordinary iron rubbing wheel was used, like that employed by stone workers for rubbing a smooth surface on marble or sandstone, and the samples to be tested were fastened to blocks of sandstone, laid face downward on the rubber wheel, which revolved at the rate of 75 revolutions a minute, being supplied with sharp sand and water. The blocks to which the floorings were cemented were of equal weight, so that the rubbing was effected under nearly the same pressure in all cases. Curiously enough, the material which resisted best this severe trial was india rubber tiling, which, after an hour's rubbing, lost only 1-64 inch of its thickness, and next to this, English encaustic tile gave the best results, losing only ⅛ inch in an hour's treatment. The artificial stone, known as "granolithic," was third, losing ⅜ inch, while North River bluestone lost 9-16 inch. All the marbles wore away very rapidly. A piece of marble mosaic disappeared entirely in 35 minutes, while solid white Vermont marble lost ¾ inch in an hour. Most of the wood floorings resisted abrasion better than the marble; thus white pine lost only 7-16 inch under treatment that removed nearly twice as much from solid marble, yellow pine about like white, and oak lost more than either of the pines.

The New York canal season of 1897, which has now closed, is reported as the worst on record, with the exception of that of 1895. The wheat shipments during the season reached 25,964,172 bushels, a decrease of about 11,000,000 as compared with last year, while the average rate of freight was only 2.8 per cent., as against 3.7 per cent in 1896. This year's rate on grain was the lowest on record with one exception.

THE RETAIL STORE.

Enameled Ware Consolidation.

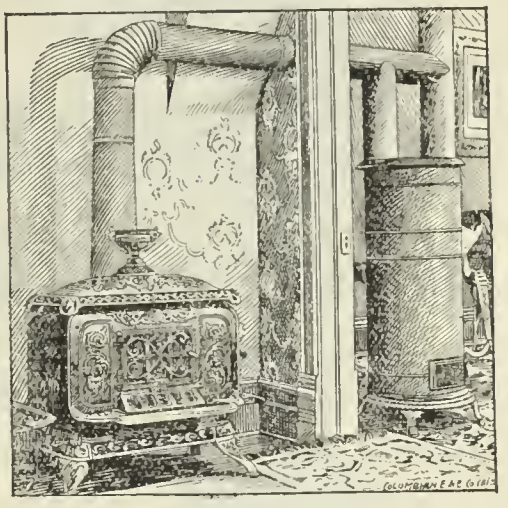
The movement looking to the consolidation of the greater number of the enameled ware manufacturers into one corporation is being actively pressed by those who originated the idea. Additional visits have been and are being made by principals to the various plants about the country for the purpose of determining a proper appraisement or ratio on which to absorb each interest. Meetings have also been held in New York this week in the same connection, leading officials of some of the Eastern and Western concerns being present. There is little doubt, however, that no agreement has as yet been consummated, the work so far being entirely of a preliminary nature. As now being considered, should the present plans be perfected the new organization will doubtless include all the concerns save one or two who are important factors, and, while not willing to join the enterprise, would be pleased to see it accomplished. The promoters of this project assert that they expect to make their profits by economies in purchases and production and in selling expenses rather than by advances in price. Among the trade, by those well informed, it is believed the harmonizing and absorption of so many conflicting properties will not be accomplished without considerable difficulty; nor is it believed that the contemplated consolidation will be effected in the immediate future. On the other hand, there is an impression that the prospects for an ultimate agreement are more distinct than they were a week ago.

An Incandescent Petroleum Lamp.

In *The Metal Worker* of October 30 we reprinted from an English exchange an illustration and description of an incandescent petroleum lamp just brought out by the Incandescent Gas Light Company, Limited, of London. Since publishing the account we have received a great many inquiries from different parts of the United States from readers who wish to know where this lamp could be obtained and if it was yet on the American market. We have written to the Incandescent Light Company, Limited, 14 Palmer street, London, England, who replied as follows: "The incandescent petroleum lamp is not yet on the American market, but will be shortly. We are preparing to sell the rights for this lamp in other countries, but are not in negotiation regarding the American rights. You will, of course, understand that it will be necessary for any one purchasing the rights for the oil burner to make arrangements with the Welsbach Company for the supply of mantles."

The Anderson Heating Drum.

In the accompanying illustration we show a heat saving device used in connection with a stove, which is being put on the market by the Anderson Heat Saving Apparatus Company of Marshalltown, Iowa. The drum consists of two cylinders forming a smoke chamber, with diaphragms reaching from the top nearly to the bottom between the inner and outer cylinders, and the method of attaching the smoke pipe to the drum may be readily seen from the illustration. In operation a damper between the two pipes which are attached to the drum gives a direct draft when the fire is first started. On closing this damper after the fire is in operation the products of combustion must pass down the branch pipe at the left into the cylinder, and then down to the bottom of the diaphragms, before it can pass up on the other side and find the outlet to the smoke pipe to the chimney. By this movement of the products of combustion both the inner and outer cylinders are heated. The cylinders are connected with a cast iron top and base resting on feet, leaving a space underneath the bottom so that the colder stratum of air along the floor may rise and come in contact with the hot surfaces of the two cylinders and keep the air in the room in circulation. By this means the colder air from the further points of the room is drawn to the heating drum, and after being warmed is discharged at the top, so that a continual current of warm air is provided to replace the cold air which is brought to the heating drum. A strong radiant heat is derived from the outer cylinder. It will be seen that this device uses no coal and is only a means of economizing heat that would be otherwise lost in the chimney. It is claimed by the manufactnrers that under test it has had an effect equal to a saving of 50 per cent. in fuel, and has been used in connection with heating and cooking stoves, hot air

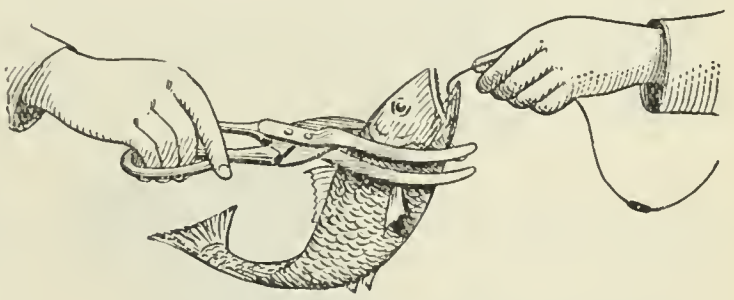


The Anderson Heating Drum.

furnaces and house heating boilers with excellent results. The company issue circulars giving full information in reference to construction and prices.

Koenig's Fish Tongs.

The Pure Aluminum Novelty Company, 15-21 Camfield street, Newark, N. J., are manufacturing Koenig's patent fish tongs, as here illustrated. They are about 9



Koenig's Aluminum Fish Tongs.

inches long, and being made of aluminum are very light. Used as shown in the cut they are convenient for holding any kind of fish when removing a hook and are equally serviceable in cleaning or handling fish, lobsters, crabs, &c., without soiling hands or clothing. They are light, strong and durable, weigh 4½ ounces and from the nature of the material will not rust or tarnish.

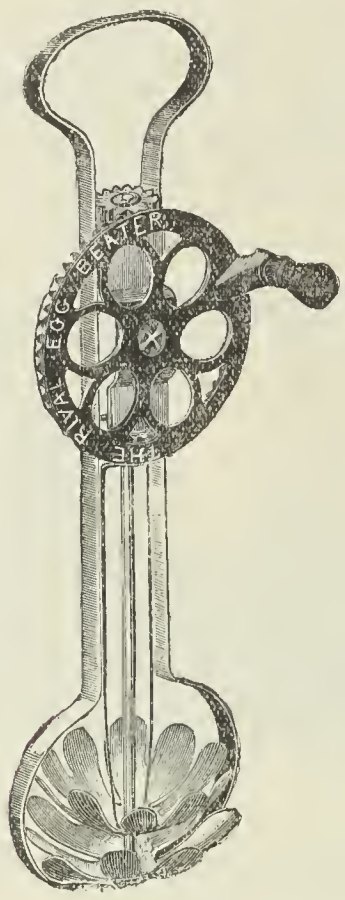
McCray Refrigerators.

Catalogues have been received from the McCray Refrigerator & Cold Storage Company, Kendallville, Ind. Catalogue No. 25 treats mainly of household refrigerators. These are constructed of hardwood and are built on the McCray patent system of cold storage. The walls are packed with mineral wool and an automatic circulation of cold air is secured by the internal arrangement. The company make the suggestion to those who contemplate building new residences to make allowance for a refrigerator or cold storage room. They furnish plans and specifications so that a refrigerator can be iced from the outside, avoiding the trips of an iceman through the house. A design of this kind is illustrated in the catalogue. Other special designs are shown, including large refrigerators or cold storage rooms lined with tile. Catalogue No. 30 is devoted to refrigerators for hotels and public institutions. This

comprises 20 pages and shows full plans and details of a number of cooling rooms, built for prominent asylums and other establishments requiring extensive facilities of this character.

The Rival Egg Beater.

The accompanying cut represents an egg beater put on the market by the Standard Company, 107 Haverhill street, Boston, Mass., as an addition to their line of beaters. The construction of the article is somewhat

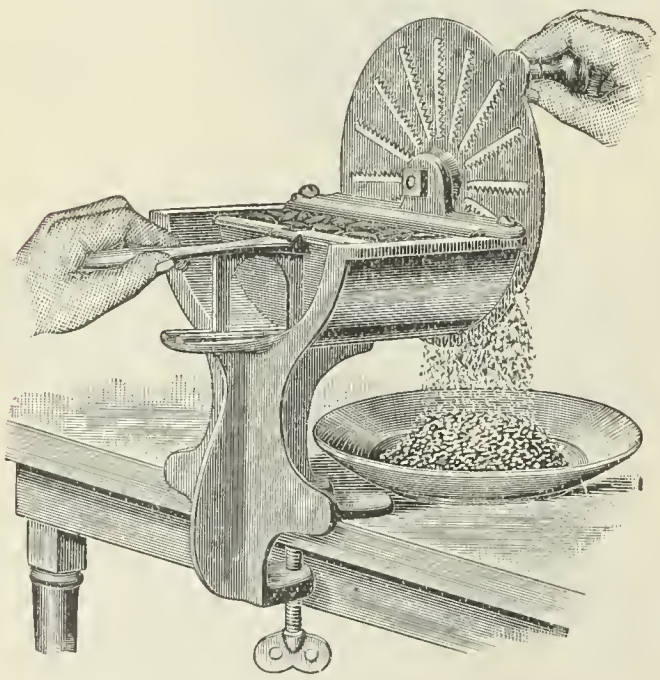


The Rival Egg Beater.

different from others on the market, this being particularly noticeable in the form of the revolving beaters. The company claim exceptional working qualities for the beater.

Champion Grater.

The Specialty Novelty Company, 43 East Marion street, Lancaster, Pa., have brought out the Champion grater, here shown. It is exceedingly simple in construction, and



The Champion Grater.

designed for grating cocoanut, walnuts, almonds, chocolate, horseradish, vegetables, cheese, crackers and a number of similar commodities freely without clogging. After the material is placed in the receptacle it is forced against the toothed disk by a pusher operated by the other hand. The grater is tinned and can be clamped to table, &c. Allerton-Clarke Company, 97 Chambers street, New York, are general agents, and C. B. Corwin, 15 Whitehall street, this city, handles the goods for export.

Shelving Near the Ceiling.

Herewith is shown an arrangement of shelving supported by gas pipe erected in the Hardware store of M. E. Coffee, Burnet, Texas, to utilize the space near the ceiling. For this purpose 1¼-inch gas pipe was used, making the uprights long enough to reach from the floor to the ceiling, with flanges on both ends which were fastened by screws at each end. The cross pieces of pipe screwed into the tees, upon which the shelves rest, are 12 inches long, and so extend about 1 foot over the showcase

Shelving Near the Ceiling.

and the same distance over the aisle behind the counter. The boards are notched to fit around the uprights. The floor space occupied is but 3 inches, the diameter of the flanges. Six feet between the uprights is mentioned as a desirable distance to place them. The shelves were put on both sides and across the rear of the store, and are reached by traveling ladders. It is stated that the cost of the shelving was between 15 and 20 cents per running foot, not painted. The cross pieces over the counter could be made longer if desired and utilized for hanging goods on.—*The Iron Age.*

The time is not far away when the trade will have an active interest in everything relating to maple syrup, and as a good preparation they would do well to secure a copy of Catalogue A, issued by J. M. & L. A. Osborn, Cleveland, Ohio, who are jobbers of Maple Sap and Syrup Men's Supplies. The catalogue, which is nicely printed and copiously illustrated, shows all sorts of syrup goods, both those relating to the collection of the sap and the shipping of the syrup, while the end of the catalogue calls attention to Tin Plates, Roofing Plates, Enameled Ware, Sap Pan Iron, &c.

The Gannaway Hardware Company, Louisburg, N. C., have sold out their business to the Louisburg Hardware & Supply Company. The officers of the new company are J. J. Barron, president; W. L. Paynes, vice-president and general manager, and J. S. Barron, secretary and treasurer. A wholesale and retail trade is done in Shelf and Heavy Hardware, Stoves, Tinware, Implements, Sporting Goods, &c. The new firm advise us that they have largely increased the stock formerly carried and are in better position to handle business than heretofore.

South Dakota Retail Merchants' Association.

The South Dakota Retail Merchants' Association, which was organized in July last, is meeting with gratifying success in its effort to interest the retailers of the State, and we are advised that it now has a membership of 324, with local unions in 25 towns. The association covers retailers in all lines, including Hardware, and its objects are to take such measures as will keep the retail trade at home, which is now divided between the retail merchants of the State and catalogue houses in the large cities; to establish a bureau through which all information of value to the retailers of the State in general can be imparted; to be the medium by which retail merchants may become acquainted with each other and so put themselves in a position to work unitedly, and to prevent fraudulent failures and all forms of fraud.

The association has obtained satisfactory results, young as it is, in the way of enforcing the peddler license law and in other ways. An active campaign of education, for the purpose of teaching customers that it is to their interest to buy of their home merchants, will be inaugurated as soon as the standing Committee on Press and Literature can be organized. The chief purpose of the organization is to prove to the public that it pays them much better to trade at home than to give any patronage to outside concerns.

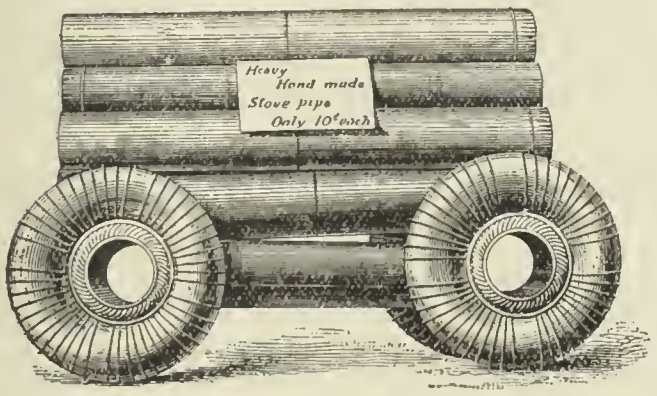
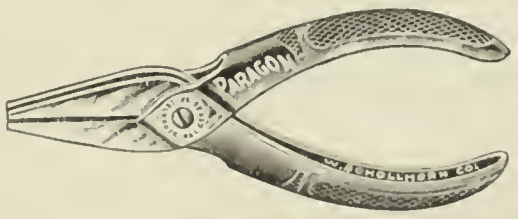


Fig. 2.—A Carload of Pipe.

Paragon Flat Nose Pliers.

William Schollhorn Company, New Haven, Conn., have brought out the Paragon flat nose pliers, here shown.



Paragon Flat Nose Plier.

They are stamped from sheet steel and the jaws are tempered. They are made in 4, 4½, 5, 5½ and 6 inch sizes, nickeled, fully warranted and are moderate in price. In New York the goods are carried in stock by Underhill, Clinch & Co., 94 Chambers street.

Locomotive and Car.

The accompanying cuts show an ingeniously arranged locomotive and car constructed by the Barrett Hardware Co. of Joliet, Ill., for display in their show window. The articles used in building the locomotive, Fig. 1, were as follows: The boiler was an 8-gallon Milk Can; smokestack, two 2-quart Tin Cups with two pint Basins on top; head light, a Police Lantern; bell, a Hand Bell; boiler rests, deep Drip Pans; axles, 1-inch Machine Bolts;

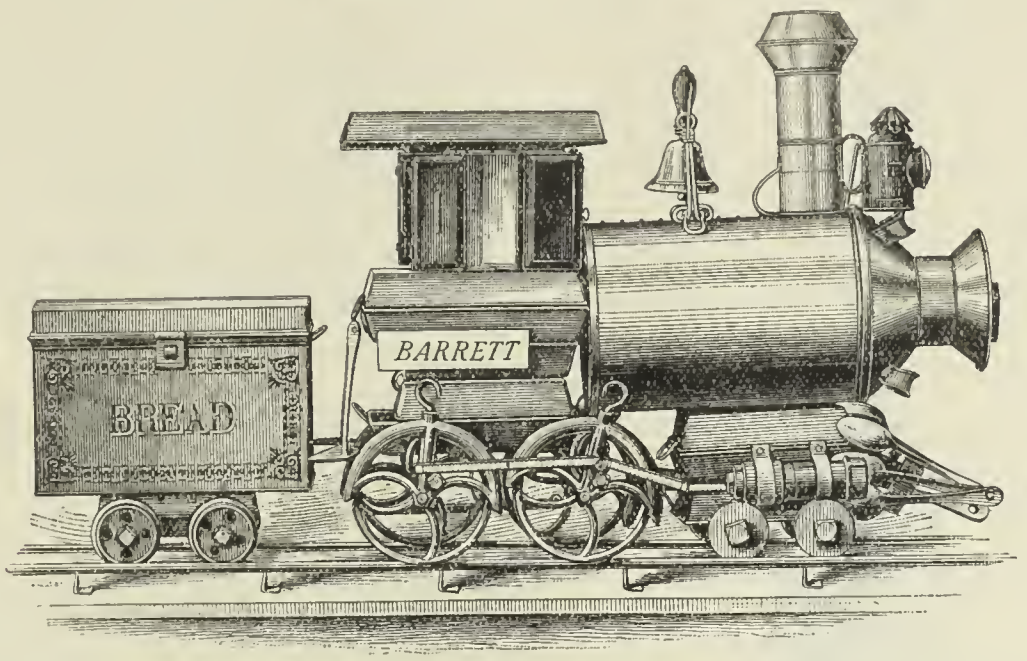


Fig 1.—A Western Locomotive.

front wheels, 1-inch cast Washers; driving wheels, Well Wheels; cow catcher, Basting Spoons; piston, 2-foot Rule; steam cylinder, a 2-inch Nipple with a cap on one end and bushing on the other. The cab was made up of four deep Roasting Pans, Folding Lunch Boxes, with a shallow Drip Pan on the top for the cover; tender, a Bread Box on four Hay Carrier Wheels; ⅝-inch Bolts for axles, with babbitt metal resting on the axles to carry the Bread Box. T Barn Door Rail answered for track. The car, Fig. 2, had wheels composed each of four Elbows, with 6-inch Stove Pipe shoved through them for axles, while a Pipe Collar at each end gave an artistic finish. On this car was piled Stove Pipe. The articles chosen for the construction of the train, especially for the locomotive, were admirably adapted to their purpose. The exhibit attracted a great deal of attention and elicited much favorable comment.

U. T. Hungerford.

U. T. Hungerford, dealer in Brass, Copper, &c., goes from 29 Chambers street to 121 Worth street, New York, where he has taken the whole of a six-story building as a headquarters for everything in his line

The house in question aim to carry the largest and most complete stock in the country in their particular line, and for this reason are enabled to fill orders very promptly. Mr. Hungerford is favorably known to the trade throughout the country as the former New York representative of Wallace & Sons, Brass and Copper manufacturers, of Ansonia, Conn., who discontinued business about one year since, and has associated with him George Davidson, Bernard Ris and J. R. Van Brunt, who were with the old house of Wallace & Sons for many years.

With the exception of one floor the whole of the new building will be used for the warehousing of his large stock of Brass and Copper goods.

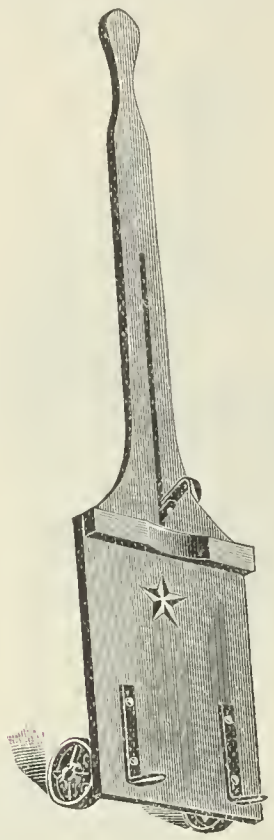
The other floor will be used exclusively for office and showroom purposes. The location is an excellent one for this line of business, and the firm not only secure more room by the change but also much better facilities of every kind.

Cooper & McKee, Brooklyn, N. Y., are running their Refrigerator factory full force, accumulating a large stock in anticipation of heavy orders with the opening of their season, January 1. Since last season they have built another four-story brick warehouse and with their increased storage facilities can more fully carry out their policy of keeping a large stock on hand for prompt shipment. They advise us that theirs is now one of the largest plants in the country and that their trade, covering the Eastern, Middle and Southern States, is satisfactory. They also men-

tion that their export trade during the past year was larger than ever before. The company manufacture full lines of both hard and soft wood Refrigerators.

The Star Truck.

Boston & Lockport Block Company, Boston, Mass., are putting on the market a truck as shown in the accompanying cut. It is made of selected ash, with a steel axle, having wheels 3¾ inches in diameter. Metal points are



The Star Truck.

provided to keep the load in its place, and a hook to grip and hold a barrel or cask. The truck is designed for use in stores, about barns and in dwelling houses, especially for handling barrels, but also for boxes, bundles and other articles. The truck is designed to retail for $1.25 each.

MEMORANDA.

The Stove Dealers' Association of Washington, D. C., recently held a meeting at which President Harrover presented an encouraging report on organization. The Committee on By-Laws also submitted a report which was read and approved. During the session an interesting discussion took place concerning four important business factors—the manufacturer, the wholesale dealer, the retail dealer and the consumer. According to the reports it appeared to be the sense of the meeting that "a proper observance of business principles by dealers would insure an equitable distribution of patronage from consumers and the result would be beneficial both to employer and employed." S. S. Shedd & Brothers, Dodson & Hodgson, P. G. Lauer, W. H. Mehler and Barber & Ross were appointed a Committee on Organization.

The Kansas City Tin & Repair Shop Company, Kansas City, Mo., have been incorporated, with a capital stock of $10,000.

Anderson Bros. have started a new Tinware store at Springfield, Minn.

H. Rogers is building a new Tinware store at Maynard, Iowa.

A new Tinware store has been opened by J. Burr, at Martin, Mich.

In their advertisement elsewhere in this issue, McClure & Co., 211, 213, 215 Second avenue, Pittsburgh, Pa., direct attention of the trade to certain sizes of Heater Pipe Tin which they have in stock. This Tin is of the Cupola brand, and is referred to as possessing superior quality and finish. We understand that the firm are prepared to make attractive prices on these goods.

The Quintette-Bell Mfg. Company, 103 North Second street, St. Louis, Mo., issue circulars in the interests of the Star Metal Polish, which they state is warranted to contain no acid or poison, and is adapted for cleaning and polishing silver, nickel, brass, copper, tin, &c. A number of testimonials speaking in the highest terms of its excellence are presented. The same firm also make the Star Cleaner, a soap for cleaning and polishing bathtubs and stop cocks, stone and marble, &c.

Every department in the large factory of the Lalance & Grosjean Mfg. Company, at Woodhaven, Long Island, N. Y., is actively employed at the present time. The firm report a very satisfactory demand for their products, orders being received in a large and steady volume not only from this country but from abroad. This week two large foreign orders for Enameled Ware were filled, one from Tokyo, Japan, and the other from Adelaide, South Australia.

Luck & Phelps, Hardware and Stove merchants, dealers in Firearms, Cutlery, &c., at Salisbury, Mo., have dissolved partnership. The business will be continued by J. W. Luck.

The Wells & Nellegar Company, wholesale Hardware merchants, 72 to 76 Lake street, Chicago, have secured a number of the prominent salesmen hitherto connected with John Alling & Co., and have thus enlarged their force of traveling men. It was an excellent opportunity to work into new trade, as it is expected that the salesmen will be able to influence a very considerable part of the business which they have been doing in the interest of John Alling & Co., now that that house have passed out of existence.

Henry N. Whittemore is successor to Daniel Latham in the wholesale and retail business, 141 and 143 State street, New London, Conn. The large stock carried comprises Hardware, House Furnishing Goods, Electrical Supplies, Oils, &c. Mr. Whittemore contemplates enlarging the stock and making a number of improvements in the store.

Geo. C. Miller and Oris Wentworth have opened up in the Hardware business, at Unionville, Mo., under the style of Miller & Wentworth. Their stock comprises Shelf and Heavy Hardware, Tinware, Stoves, Agricultural Implements, Wagons and Buggies, &c. They are occupying a building which, they state, has been remodeled and is now up to date in every particular.

Johnson & Chenoweth have embarked in the wholesale and retail Hardware and Implement business at Shoals, Ind. They are also carrying Stoves, Tinware, Wagons, Buggies, &c.

Frederick P. Manning has opened up a Hardware store in the Foote Building in Warrenville, Ill. Mr. Manning is carrying a line of Shelf Hardware, Stoves, Tinware, Galvanized Steel Roofing, &c. About December 15 he will commence the manufacture of Grain Purifiers and other specialties of his own invention.

C. I. Stoner, West Alexandria, Ohio, has sold a half interest in his business to Sherman Mills, who will become a partner January 1. Paints and Oils, &c., will then be added to the present stock of Hardware, Stoves and Tinware.

Howard N. Stillman has lately opened up in business at Stewartville, Minn., handling Hardware, Sporting Goods, Tinware, Bicycles, &c.

I. T. Morgans & Son, Parkersburg, Iowa, have sold their general Hardware, Tinware and Plumbing business to Morgans & Ehler, who will continue at the old stand.

C. M. Dennis, who has been in the Hardware business in Edwardsburg, Mich., since April, 1886, has just completed a new store, which provides much better facilities than the old. Mr. Dennis is accordingly carrying a larger stock of goods. His line embraces Shelf and Heavy Hardware, Tinware, Agricultural Implements, Sporting Goods, &c.

Clark & Gallup have bought out Henry E. Iseman's Hardware business in Prattville, Mich. The line of goods comprises Hardware, Agricultural Implements, Builders' Material, Stoves, &c.

John K. Ofsthus has succeeded W. I. Brebner in the Hardware and Stove line at Northwood, Iowa.

The Hardware firm of McIlwain & Kaylor, Warren, Ind., have dissolved partnership, and O. F. McIlwain & Co. are now conducting the business at the old stand. Shelf Hardware, Stoves, Tinware, Sash, Doors, &c., are handled.

A new automatic mail box for registering letters, known as the Di Brazza letter registering machine, is being tested in the Post Office in New York City. Three of the boxes are in use at present. By dropping a dime into a slot in the box, sliding a letter into another aperture and turning a handle on the machine, a registered receipt for the letter is passed out.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Wholesale prices have receded slightly under the influence of slack demand and liberal importations. The new supply, in fact, has exceeded the outlet and caused rather more pressure to sell in some quarters. The importations during the month amounted to 1770 tons. Speculation remains lifeless in this quarter and operations in London have, to all accounts, been on a smaller scale than for some time past. Retail sales were on a similarly modest scale, but no change was made in jobbers' quotations, which for small lots from store are 14¾c. per lb. for Straits Pig. The visible supply of Tin as posted on the Metal Exchange compares as follows:

	Dec. 1.	Nov. 1.	Oct. 1.
1897, tons	30,461	31,037	31,875
1896, tons	33,303	33,423	35,417

The stock in the United States December 1 is estimated at 3790 tons, 4020 tons November 1 and 3415 tons October 1.

Copper.—The market has remained in rather dull condition, with no redeeming feature outside of continued heavy consumption on the Continent, particularly of Wire Bars. Other foreign markets are taking merely fair quantities of the metal and the home trade demand continues tame, although a slight improvement was noted at the close. Values have undergone no radical change, but appear rather weak. Small lots from stock remain at about 12c. to 12¼c. per lb. for Lake Ingot and 11c. to 11¼c. for Ansonia Grade Casting Copper.

Sheet Copper.—Nothing beyond a perfunctory demand for comparatively small quantities for present use is reported. The requirements of cornice makers are pretty well filled for the season and the near approach of stock taking time disinclines dealers and consumers from buying more material than they actually need. Prices are not very firm, but jobbers continue to quote small lots from store on the basis of 15c. per lb.

Pig Lead.—What there was in the way of sign of improvement at the date of last week's report has given way to dullness and prices have weakened slightly. The buying is at present extremely conservative and confined chiefly to small lots for early delivery. American Pig in small parcels from store is quoted at 4⅛c. to 4¼c. per lb.

St. Louis advices are as follows: The Pig Lead market is dull but firm. There are rumors of a proposed combination and that smelters are in session in New York City with a view toward forming some arrangement to restrict production. There is a continued effort on the part of speculators to get into the market, but sellers of large quantities are hard to find.

Spelter.—There has been no improvement whatever in business here or in the demand and the market continues unsettled, with rather weak undertone. Ordinary Western brands are selling in a retail way at 4.65c. to 4.75c. per lb.

St. Louis advices report no change in the market for this metal. Continued dullness tends to depress the price.

Sheet Zinc.—A moderate demand exists of very ordinary type. Prices are unchanged. Jobbers quote 600-lb. cask lots at 5⅝c. to 5¾c. per lb. and smaller quantities at 6⅛c. to 6¼c.

Antimony.—Business has been moderate but prices remain steady at 7¼c. to 7½c. for Japanese, 7¾c. for Hallett's and 8½c. for Cookson's in small parcels from store.

Nickel.—The market remains steady at about 37c. to 38c. for small quantities.

Aluminum.—There is no change in this metal, for which there is a comparatively steady demand. Present prices are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100-lb. lots, 30c.

Tin Plate.—There has been no improvement whatever in business in American Plates. The market remains in a rather unsatisfactory condition, with forward deliveries about 5c. a box cheaper than spot stock. Large consumers are understood to have covered their probable wants for the first two or three months of next year and are holding off buying further ahead in the expectation of securing lower rates. At the same time the mills are nearly all running full and are believed to be well supplied with orders for a couple of months or so, while few are pressing sales in this quarter. Stocks are light and deliveries are still delayed. No expansion in the demand is looked for, however, for the balance of the year nor during the opening weeks of 1898. Consequently there is little ground for the hope of higher prices in the immediate future. The large additions to the producing capacity now under way, and which apparently will have to be reckoned with in 1898, tend to foster a nervous feeling in the trade and discourage large consumers from contracting for deliveries ahead. It is argued that the American production of Tin Plate this year has been about even with the consumption, which has been fairly liberal, and as there is no ground for anticipating such a large expansion in next year's consumption as will absorb the materially increased output of the domestic mills the result must be the usual one incident to overproduction—namely, sharp competition and lower prices. Some authorities in the trade take a more favorable view of the situation, however. They assert that the added capacity introduced by the mills now building will cut no figure to speak of in next year's market, as the larger portion of the new mills cannot be completed and ready for taking orders before the latter half of the year, when the canners' and can makers' requirements will have been filled. They look for a larger demand than usual from those interests next spring and summer, as stocks of canned goods are quite light and, in some cases, will barely suffice to meet the demand. The retail trade in Tin and Terne Plates has been very tame, as is usual at this season. Jobbers' quotations are unchanged, moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore being about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do. 95 lbs., $3.35 to $3.45; do., 90 lbs., $3 30 to $3 40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are selling slowly outside of the export goods trade.

Chicago advices are as follows: Ternes are quiet, but a rather better inquiry is reported for Cokes. Manufacturers are now making prompt shipments, so that the trade is well supplied. Regular quotations are $6.10 for a good quality of Ternes in carload lots and $3.05 for Full Weight Cokes, but it is reported that a few manufacturers are anxious to secure business for deliveries extending well into next year and have made some concessions from these rates.

A special London cable dispatch of December 1, 1897, reports on the British Tin Plate market as follows: Tin Plate steady on the basis of 9s. 6d. to 9s. 7½d. for 14 x 20 Bessemers, and 9s. 7½d. to 9s. 9d. for Siemens, f.o.b. Swansea.

Sheet Iron.—The demand for thin Sheets continues good, but there is not much inquiry for the heavier kinds. Galvanized Sheets sell in moderate quantities only. Prices are fairly firm, but concessions are made by jobbers on attractive orders. Small lots from stock sell in this section at about 2.35c. to 2.40c. for No. 27 Common Black Sheets and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanied Sheets.

Chicago advices are as follows: Some demand is reported for mill shipments of Black Sheets. The works are full of orders and prices show no weakness. Galvanized Sheets, on the contrary, have gone off slightly, notwithstanding the much better volume of business. Small lots from stock are unchanged at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—Extreme quietness continues to rule in the domestic market with values unchanged. The export demand is also very light. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.

Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3¼c.
Zinc	per lb. 2¾c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10 50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5.25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	5.00

THE IRON MARKET.

The interest in the negotiations for a consolidation of the Wire interests has overshadowed current trade developments, which have not been significant. The Wire trade seem to have quite widely come to the conclusion that it is wise to cover requirements as a hedge against the possible success of the movement toward consolidation, and many sellers have promptly announced a withdrawal of old quotations.

Some of the steel works in the Central West have been buying Bessemer Pig Iron. Steel Billets have been very quiet East and West. The feeling is gaining ground that we must go through our usual slackening of activity during the first quarter of the year, but the feeling of buyers is indicated by the desire now cropping up to couple purchases for next year with demands for delivery during as long a period in 1898 as is possible.

Pig Iron.—In New York, while in some quarters a little better movement is noted, other sellers report dullness and a tendency to accept slightly lower prices. One of the Eastern Pennsylvania foundries has during the week purchased about 9000 tons for prompt delivery. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $11 to $11 25; No. 2, $10.50 to $10.75; No. 1 Soft, $11 to $11.25; No. 2, $10.75 to $11.

The Philadelphia Pig Iron market is reported as extremely quiet, buyers showing no disposition to do anything in the way of new contracts. So far prices have been steadily maintained, but some holders are getting a little restive and unless the demand improves it will be difficult to keep them in line. Consumers appear to be doing very well, and while they are not buying, they are certainly taking large lots of contract Iron. It is a waiting market, and one that will be closely watched, because of the large interests involved, although the market is believed to be perfectly safe for a long pull. To-day's quotations are about as follows for seaboard deliveries, subject to the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75 to $11.

Sales agents in the Chicago market report increasing business in sight. Sales have been made of moderate quantities of local Foundry and Bessemer Iron and Southern Foundry. The largest contract taken was probably for 1000 tons. Inquiries now in hand call for somewhat larger amounts and for deliveries extending through a considerable part of the coming year. The better inquiry leads to the belief that quite a volume of business will be done in December. Consumers have latterly been making a test of the market to develop if possible weak spots. Some of them report weakness in Southern prices to local sales agents and weakness in local prices to Southern agents, but so far as can be ascertained all prices are fully as firm as they were 60 days back, when the market was quite active. Lake Superior Charcoal has been sold in small lots only. We quote for cash as follows:

Lake Superior Charcoal	$12 50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

There have been some heavy sales of Bessemer in the Pittsburgh district, for December delivery, but otherwise little change has occurred in the market during the week. We quote, f.o.b. Pittsburgh, as follows: No. 1 Foundry, $10.65 to $10.75; No. 2, $10.15 to $10.25; Bessemer, $10.15.

In the Cincinnati district, business has been quiet so far as new orders are concerned. The daily run of small lots has been about what might have reasonably been expected, with the aggregate fairly satisfactory for a dull season. Iron is going forward rapidly, and there is evidence pointing toward the seeming fact that furnaces will be ready for the buyers when buyers are ready to try the market. Price lists both as to Southern and Northern Pig are nominally unchanged and presumably steady. What few ales are quoted at less than standard quotations are found upon investigation to have some qualifications which render them unfit to base a market opinion upon. Quotations are as follow, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The St. Louis Pig Iron market is extremely quiet, but prices are being well maintained. Sales are few and confined to carload lots for immediate delivery, with an occasional order for 100 tons. Stocks in both consumers' and producers' hands continue to be reduced, which explains the strength exhibited by prices. Efforts to shade the market for delivery extending into next year have proved unsuccessful, and nearly all furnaces are a unit in refusing to accept business for delivery later than February. The market is in a fair way to advance. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.50 to $11.00
Southern, No. 2 Foundry	10.25 to 10.50
Southern, No. 3 Foundry	10.00 to 10.25
No. 1 Soft	10.25 to 10.50
No. 2 Soft	10.00 to 10.25

CHICAGO REPORT.

Scrap.—Dealers appear to be the only ones interested in buying old material at present. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$6.75	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5 50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9 c.
Red Brass	....	7½c.
Yellow Brass	....	6½c.
Light Brass	....	4 c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—Sales are light and prices are being cut. The card on carload lots of 12 tons minimum is now as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

The banking firm of Alexander Brown & Sons, Baltimore, Md., are reported to have closed a deal whereby the capital stock of $20,000,000 of the Pittsburgh Traction Company, embracing 117 miles of street railways, has been transferred to a syndicate of capitalists in London, New York, Baltimore and Philadelphia.

THE HARDWARE TRADE.

With the opening of December it is anticipated that there will be a falling off in the volume of business and that the general line of goods will be somewhat neglected. The demand for seasonable articles and holiday goods, however, in some measure makes up for the diminished business in other lines, and from some sections of the country reports indicate that in these departments there is very little reason for complaint. There are also indications of a somewhat better demand in a few lines, and the tone of the market on the whole seems to be at least as good and perhaps a little better than a week ago. The most important matter affecting the interests of the trade at large is the effort being made for the consolidation of Wire Rod interests and the resulting control of the manufacture of Wire products. These negotiations are being vigorously prosecuted, and while thus far the matter has had but little effect on the market, it is apparently beginniug to attract the attention of merchants, who realize the possibility of the successful carrying out of the plans. There has not been sufficient faith in the final success of the enterprise to lead buyers to enter the market at all freely in anticipation of advanced prices, but as we go to press its effect on the market is apparent. In other respects the market remains substantially as before. Manufacturers are generally pursuing a conservative course and are not attempting to force business by low quotations. This is in part owing to the hopeful view of the future course of trade and the expectation that goods can safely be held until spring, when possibly better prices may prevail. The market will naturally be closely watched for the next month or two, when in many lines manufacturers will have an opportunity to accumulate stocks for the business of the coming season. There is an evident improvement in collections, and the trade enters on the last month of the year in good condition and with hopeful anticipations for 1898.

Advices from Chicago.—The Shelf Hardware trade improves instead of falling off, as might be expected at this time of the year. The severe winter weather has stimulated trade considerably. The activity is expected to extend over at least the first half of December. The demand for Skates, Sleigh Bells, &c., has been light until now, but it has suddenly awakened, and telegraph orders for Skates have been received within the last few days. Mail orders for all kinds of Shelf Hardware have increased considerably of late. The demand for Tinware and Metals has fallen off somewhat, but this is usual at this season. Jobbers are now making preparations for taking inventory. The consolidation of Wire interests under negotiation excites much interest in the local Hardware trade, but it is not stimulating business to any appreciable extent. The magnitude of the project causes general doubt among Hardwaremen that it can be consummated, notwithstanding the favorable reports in circulation. Heavy Hardware jobbers report that November went out with flying colors. Sales for the month ran ahead of those for October, and many back orders are carried into December. The trade is certainly much better than usual at this season. Collections are very good in all lines.

Advices from St. Louis.—The Hardware trade is reaching that point where it runs largely to odds and ends to sort up. The time for annual inventories is close at hand and dealers are allowing their stocks to run down as much as the circumstances will permit. Holiday goods have sold very freely—better, in fact, than for several years past. The cold weather at present prevailing has stimulated the demand for seasonable goods, and rush orders are now the order of the day. Tin Plate and Black Sheets are both selling freely, but prices are anything but satisfactory, especially on Tin Plate. Shot is very active, and considerable interest attaches to this department on account of the prices quoted by a local manufacturer. Shelf Goods are in mod erate demand, while the demand for Builders' Hardware has fallen off to practically nothing. Machinists' Supplies, however, continue to be ordered very liberally. The tone of the market is not quite so strong, and although there are no radical changes in prices there is more or less of a desire on the part of the manufacturers to secure orders, and they are willing to shade prices to get them. Collections are satisfactory.

NOTES ON PRICES.

Wire Nails.—During the past week the market has been firm. The fact that negotiations are in progress for the consolidation of Wire Rod interests evidently has influence on the manufacturers at least in preventing them from yielding in price, inducing them to take the view that it is better to hold the Nails so as to be in a position to meet the large demand which is anticipated, and perhaps to realize better prices on the Nails than if disposing of them at any concessions from current quotations. There are indications of an anxiety on the part of buyers to cover their requirements, and a good many orders and inquiries have been coming in to manufacturers and their representatives. The manufacturers, however, are holding off, naming somewhat higher prices and refusing to accept orders for future delivery. New York quotations have been $1.60 to $1.65 for small lots from store.

Advices from Chicago.—Manufacturers are not pushing for business, but are evidently waiting to see the result of the negotiations for control of the Wire trade. A few inquiries have come up recently, which are presumably prompted by reports of the negotiations, but as far as can be ascertained no heavy contracts are being placed. Jobbers are still making prices to move their stocks and quote $1.45 to $1.50, according to character of the order and the accompanying bill of goods.

Advices from St. Louis.—The market is easier but the demand is very satisfactory. Large quantities have been shipped to Colorado points on account of the cut in freight rates, and the local market is relieved considerably in consequence of these sales. Jobbers report an excellent demand and are quoting $1.55 to $1.60, base, for small lots from store.

Cut Nails.—There is little of interest to note in the Cut Nail market. Prices are unchanged. The volume of business is small. New York quotations for small lots from store are $1.35 to $1.40.

Advices from Chicago.—Not much is doing in Cut Nails, which continue to be quoted at $1.45 in small lots from stock.

Advices from St. Louis—Continued weakness is noticed in this department. Jobbers report a fair trade only at $1.40, base, to $1.45, for small lots from store.

Barb Wire.—Under the influence of negotiations for combining Rod interests the market is decidedly firm, and some mills are refusing to accept orders for future delivery.

Advices from Chicago.—Trade is quiet in every direction. The Southwestern demand has not been so heavy as was expected. The trade is also light in other quarters, although some advance contracts are now being made for spring shipment. Prices are unchanged at $1.55 to $1.60 for Painted and $1.85 to $1.90 for Galvanized in small lots from stock.

Advices from St. Louis.—The demand for Barb Wire is light and manufacturers look for no improvement until after the turn of the year. Prices are fairly well maintained. Jobbers report sales as being light, and quote $1.55 to $1.60 for Painted, with 30 cents per hundredweight additional for Galvanized.

Smooth Wire.—There is but comparatively little doing in Smooth Wire. Quotations remain as before. In some cases, however, these prices are slightly shaded.

Carriage Bolts, Machine Bolts, &c.—Manufacturers of this line of goods report a good business and refer to the outlook as promising. While there is no rigid agreement between the manufacturers as to prices, the market is in better condition than a month or two ago and prices are on the whole pretty regularly maintained.

Wrought Iron Pipe.—The manufacturers of Wrought Iron Pipe are experiencing some annoyance from the competition of jobbers who purchased at lower prices than are now ruling. While the leading manufactnrers are maintaining prices steadily, this causes a slight irregularity in the market.

Galvanized Iron Range Boilers.—Dealers report the demand for these goods as quiet and prices somewhat weaker. The ruling retail discounts off the list for Boilers here are as follows:

	Per cent.
Galvanized Iron Range Boilers to and including 52-gallon,	75 and 10
" " " " above 52-gallon..... ..	70 and 5
" " " " Extra Heavy, to and including 52-gallon	70
Galvanized Iron Range Boilers, Extra Heavy, above 52-gallon.....	70

Plumbers' Earthen Ware.—As usual as this time of the year, the demand has fallen off to a considerable extent. The outlook is regarded as favorable to an improved business in the coming spring. Dealers quote a disconnt of 60 per cent. on the list of December 9, 1895.

Glass.—There is nothing new to report in the Glass sitnation, as the conferences held between manufactnrers and workmen have not resulted in any agreement as to the wage scale for the coming fire. The differences were not great, as both sides made concessions, and much disappointment was felt by the workmen and by some of the manufacturers. Nothing of interest has transpired in the

local market, and business continues quiet. Prices remain unchanged and are as follows: For less than carload lots the New York price is 60 per cent. discount. Chicago price for like quantity is also 60 per cent. discount. Imported Glass is quoted at 60 and 10 per cent. discount.

White Lead.—Corroders report about the usual business for the season in Dry White Lead, the greater portion of which was in the form of contracts for next year's delivery. The movement of Lead in Oil has been fair, but chiefly moderate quantities for early deliveries. Old list prices are still quoted by corroders, but jobbers sometimes shade the official rates when desirable miscellaneous orders may be captured through such action.

Red Lead.—Sales to quite good amount have been made for prompt delivery and some orders are being placed for next year. The business is only fair in volume, however, and mostly at former prices.

Linseed Oil.—Except that there has been a further advance in the price of raw material there is no change in the situation. The demand for Oil is only fair, and slowness of sales doubtless prevents an advance in prices. The tone of the market is strong.

Spirits Turpentine.—Business of quite extensive value has been put through here and at Southern points, and the market is firm, with prices at 34c. to 34½c. for retail quantities.

Old Paper, Rags, &c.—A fair business is being done, with no quotable change in prices. Dealers are paying about the following rates for New York city delivery:

No. 1 White Rags	per lb.	2⅝ to 2¾c.
No. 2 White Rags	per lb.	1¾ to 1⅞c.
Mixed Rags	per lb.	1 c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1½c.
No. 2 White Book Shavings	per lb.	¾ to 1 c
Light Book Shavings	per lb.	½ to ¾c.
No. 1 Mixed Shavings	per lb.	¾ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1 c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to 3/5c.
No. 1 Manila Paper	per lb.	⅝ to ¾c.
No. 2 Manila Paper	per lb.	⅝ to ½c.
Bogus Paper	per lb.	⅜c.
Common Paper	per lb.	¼ to 3/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	½ to ¾c.
Hemp Twine	per lb.	1⅝ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	¾ to ⅞c.

Old Rubber.—A fair demand is noted and prices show no quotable change. Local dealers are paying about the following figures:

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb	4 c.
White Syringes, per lb	4 c.

TRADE NOTES.

The Mossberg & Granville Mfg. Company of Providence, R. I., have opened a store at 126 Liberty street, New York, where samples of nearly all the machines which they manufacture can be seen, with a salesman in attendance, and have also opened a branch at the Philadelphia Bourse.

A factory for the manufacture of Aluminum Goods is a new industry at Hillsdale, Mich.

The Ohio Brass & Iron Mfg. Company, Cleveland, Ohio, are about to erect an addition to their plant to cost $7000.

The Thomas Brass & Iron Company, Waukegan, Ill., have begun the erection of a new foundry building 60 x 200 feet. The addition was rendered necessary by a large increase in the company's business of late.

We have received from George H. McKay, Cranston Hill, Glasgow, Scotland, illustrated circulars of McKay's Patent Steel Combination Table Leaf Bracket and Hinge, intended for tables of all kinds, folding seats, shelves, &c. This combination has been patented in this country and abroad, and we understand the American patents are for sale.

The North German Lloyd Company's champion ocean liner, the "Kaiser Wilhelm der Grosse," has again broken records in her last eastward voyage. The vessel made the quickest run from New York to Southampton, covering the distance in 5 days 17 hours and 8 minutes, or in 17 hours and 6 minutes better time than the previous record voyage, that of the American liner "St Louis." The "Kaiser," moreover, covered the 3065 knots of the trip at an hourly average speed of 22.35 knots, beating the best previous hourly average, that of the Cunarder "Lucania" on her voyage between New York and Liverpool in May, 1895, by 0.34 knots. She thus holds all records which it is possible to compare with other Atlantic steamships. In future she will only have to break her own records.

The State Agricultural Department of Kansas gives this year's wheat yield of that State as more than 51,000,000 bushels, valued at $34,000,000, an increase of 160 per cent. over last year. The total value of Kansas agricultural and live stock products in 1897 is placed at $230,000,000.

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 2, 1897.

Tin—

traits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
XX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
XX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 50	21.00	$12.50
XX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
XX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	0.75
Allaway Grade.	1C, 10 x 14; 1C, 12 x 12; 1C, 14 x 20	4.75
	IX, 10 x 14; 1X, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
STP L Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.90¢	2.50¢
17 to 20	2 00¢	2.00¢
21 to 24	2.10¢	2.70¢
25 and 26	2.20¢	2.80¢
27	2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, lb, A....$10.20 / 10%
Patent Planished, lb, B..... 9.20 / dis.
Craig's Polished Sheet Steel.....8½¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .03
Plain, ¼ inch up to 5-16 inch..... .05
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in lugots for remelting.
Small lots ..... lb, 40¢
100-lb lots.....lb, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....lb, 34¢
100-lb lots.....lb, 33¢
Nickel Aluminum Casting Metal.
Small lots.....lb, 39¢
100-lb lots.....lb, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....lb, 35¢
100-lb lots .....lb, 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....lb, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 lb or more. Less quantities, 5¢ lb additional.

Wider than	0-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	lb	lb	lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping .....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized .....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne .....70&15%

Gutters—

Galvanized Roof 80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. lb square,	$4.75	$4.50
Galv. lb square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—
Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—
$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—
Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—
14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—
10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.. .....8 @ 12¢
Iron Paint, Bright Red.....lb 2 ¢
" " Brown .....lb 1½¢
" " Purple .....lb 2½¢
" " Ground in oil, B. Red, lb 6½¢
" " Ground in oil, Red. lb 6½¢
" " Ground in oil, Brown, lb 5½¢
" " Ground in oil, Purple, lb 6½¢
Linseed Oil, Boiled, in bbls.....37¢
Linseed Oil, Raw, in bbls.....35¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American..... .5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs, 3 to 6 ¢
Sipe's Japan Oil, in bbls., lb gal..... .34¢
Spirits Turpentine, in bbls., lb gal....35¢
Asphaltum, Trinidad Refined, lb ton.$45
Tarred Felt, 1 Ply, lb 100 lb.....$1.25
Tarred Felt, 2 Ply, lb roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, lb roll 108 sq. feet.....$1.25
Roofing Pitch, lb bbl. of 500 lb.....$3.00

NEW YORK, DECEMBER 3.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

	6-in. wider than	14-in. and including	24-in.	30-in.
		₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19		$0.38	$0.40	$0.43
" 20		.40	.42	.45
" 21 to 23		.42	.44	.47
" 24		.42	.46	.49
" 25		.43	.47	.50
" 26		.43	.50	.55
" 27		.44	.53	.58
" 28		.44	.53	.60
" 29		.45	.56	.65
" 30		.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8½@8¾¢
Hallett's.....₩ lb, 7¾@8¢
Japanese.....₩ lb, 7½¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-10-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive.	.38

35% off.

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18¼@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Pieco.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos 10 to 16	₩ lb, 2.00....	2.30¢
Nos. 17 to 21	₩ lb, 2.10....	2.40¢
Nos. 22 to 24	₩ lb, 2.20....	2.50¢
Nos. 25 and 26	₩ lb, 2.30....	2.60¢
No. 27	₩ lb, 2.40....	2.70¢
No. 28	₩ lb, 2.50....	2.80¢
American B. B.	₩ lb. 4¢	

Russia, Planished, &c.
Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb, A, 9¾¢; . 8¾¢ net
Craig Polished Sheet Steel..... ₩ lb 8½¢

Galvanized.
Nos. 10 to 16.....₩ lb, 12¢
Nos. 17 to 21.....₩ lb, 13¢
Nos. 22 to 24.....₩ lb, 14¢
Nos. 25 to 26.....₩ lb, 15¢
No. 27.....₩ lb, 16¢
No. 28.....₩ lb, 17¢
No. 29.....₩ lb, 19¢
No. 30.....₩ lb, 21¢
75&10& 5% off.
36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4⅜¢
Bar.....5¢
Pipe.....5¾¢. 20%
Tin Lined Pipe.....12 ¾¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6¾¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red, bbls. and ⅛ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1¼¢
Red Venetian, American..... @1¾¢
Linseed Oil:
Raw, ₩ gal.....40¢
Boiled.....42¢
Spirits Turpentine:
In bbls.....34@34½¢
In cases.....42@42½¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5 ¢
Clarified.....₩ lb 4¾¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilla.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil, ¼c. ₩ lb higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " Low Pressure....70%
" Radiator Valves.....70%
" " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1 00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75&10%
Galvanized Iron Range Boilers above 52 gallon.....70 &5%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanized Iron Range Boilers, Extra Heavy, above 52 gallon.....70%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....00%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated.....40&10%
Solid Bronze.....25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%

1890 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft.....1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.	₩ bbl.	$1.82@$1.83
Rosin, E & F.	₩ bbl.	1.84@ 1.87
Rosin, G. & H.	₩ bbl.	1.90@ 1.95
Rosin, I. & K.	₩ bbl.	2.00@ 2.05
Rosin, M. & N.	₩ bbl.	2.10@ 2.25

Seamless Brass Tubes—

Net List, Feb. 1. 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:
Best Bangor, ₩ sqr. .....$3.75@$5.00
No. 1 Bangor Ribbon.....3.35@ 3.75
Pen Argyle, ₩ sqr.....3.75@ 4.35
Peach Bottom, ₩ sqr.....4.75@ 5.60
No. 1 Chapmau, ₩ sqr....3.80@ 4.80
Lehigh Slates, ₩ sqr .. ..3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....$2.50@$3.55
Purple, ₩ sqr.....3.25@ 4.00
Unfading Green, ₩ sqr...3.75@ 4.50
Red, ₩ sqr.....9.00@11.00

Solder and Soldering Fluids—

Solder—

½&½ guaranteed.....10¾@11¢
No. 1.....9¾@10½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb.....4¢
5% dis.

Yager's Soldering Salts.
½ lb bottles, each.....30
Large quantities, ₩ lb.....40

Soldering Coppers—

Per lb.....15½¢@17½¢ ne

Spelter—

Western Spelter.....4.65@4¾
Bertha (pure).....7@7½

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15¼
Straits, pigs, lb lb.....14¾
Straits, in bars, ₩ lb.....15½

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14	$4.7
		14 x 20	
" "	IX,	10 x 14	5.7
		14 x 20	
" "	IXX,	14 x 20	6.7
" "	IXXX,	14 x 20	7.7
" "	IXXXX,	14 x 20	8.7
" "	DC,	12½ x 17	4.2
" "	DX,	12½ x 17	5.2
Allaway Grade,	IC,	10 x 14	4.2
		14 x 20	
" "	IX,	10 x 14	5.0
		14 x 20	
" "	IXX,	14 x 20	5.7
" "	IXXX,	14 x 20	6.5
" "	IXXXX,	14 x 20	7.2

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14	$3.50 @ 3.6
		14 x 20	
" "	IX,	10 x 14	4.35 @ 4.4
		14 x 20	

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	10¢
95 lb	15
90 lb	20¢
85 lb	25¢

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating	8.00 @ 9.25
STP L Grade, 10 to 12 lb coating	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....$9.10
IXX, 14 x 28..(112 sheets).....9.80
IXX, 14 x 31..(112 sheets).....10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade, IC, 14 x 20.....$5.00
" " IX, 14 x 20.....6.00
Allaway Grade, IC, 14 x 20.....4.25
" " IX, 14 x 20.....5.00

Coke Plates, Bright—

Steel Coke, IC, 14 x 20.....$4.25
IX, 14 x 20.....5.25

Terne Plates—

MF, IC, 14 x 20.....$6.25
20 x 28.....12.50
Worcester Grade, IC, 14 x 20.....4.25
20 x 28.....8.50
Deau Grade, IC, 14 x 20.....4.00
20 x 28.....8.00
Gilbertson's Old Method, IC, 14 x 20..7.50
20 x 28..15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved pattern, ₩ doz...18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain	72%
1¼ and less, Galv.	67%
1½ and larger, Plain	78%
1½ and larger, Galv.	70%
Screw and Socket Joint Casing	65%
Inserted Joint Casing	60%
Boiler Tubes, 2¼ inch and smaller	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

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Wilson, R. M..... 28
Wister, L. & R. & Co..... 84
Wood, Alan Co..... 74
Wood Co., W. Dewees..... 84

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Randolph & Clowes, Waterbury, Conn.

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Tower, F. W, Springfield, Mass.

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Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
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Eller, J. H. & Co., Canton, O.
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Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Poorman Mfg. Co., Piqua, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 2. Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Crimping Machines.
Packham Crimper Co., Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Sciner & Co., Indianapolis, Ind.

Dampers.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co, Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Dinner Pails.
Kieckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

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Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
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Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Berger Mfg. Co., Canton, O.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
May & Flebeger, Akron, Ohio.
Mt. Penn Stove Works, Reading, Pa.
Pease, J. F., Fice Co., yracuse, N. Y.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Turner Heater Co., Bristol, Ct.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Shepard, Sidney & Co., Buffalo, N. Y.

Galvanizing.
Gregory, Thos. Galvanizing Works, Brooklyn, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Whelan, Dennis, J., Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill
Barstow Stove Co., Providence, R. I.
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Drake, W. H., Newark, N. J.
Excelsior Steel Furnace Co, Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
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Gurney Heater Mfg. Co., Boston, Mass.
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Magee Furnace Co., Boston, Mass.
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Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fice Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
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Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York
Vance Steam Boiler Works, Geneva, N. Y.
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Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
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Central Stamping Co., 23 and 25 Cliff St., New York.
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Republic Iron works, Pittsburgh, Pa.

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Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lard Cans.
Kieckhefer Bros. Co., Milwaukee, Wis.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Huse, Jos. & Son, Boston, Mass.
Munsell, Eugene & Co., 218 Water St., New York.

Nickel Plating Outfits.
Eddy Electric Mfg Co., Windsor, Conn.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Fitter and Crimper.
Blumer, Doscher Mfg. Co., Brooklyn N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
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Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

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Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. & Co., Cincinnati, O.

Radiator Rests.
Gorman-English Co., Wilkes Barre, Pa.

Radiators, Hot Air.
Castle, Wilmot & Co., Rochester, N. Y.
Excelsior Stove Mfg. Co., Quincy, Ill.
Waste Heat Radiator Co., Buffalo, N. Y.

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Fowler & Wolfe Mfg. Co., Phila., Pa.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
Wheeler, E. S. & Co., New Haven, Ct.

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Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Baldwin Refrigerator Co., Burlington, Vt.
Challenge Corn Planter Co., Grand Haven, Mich.

Registers.
Berger Bros., Phila., Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Highton, Wm. & Sons, Boston, Mass.
Schreiber & Conehar Mfg. Co., Dubuque, Iowa.
Tuttle & Bailey Mfg. Co., 83 Beekman St., New York.

Roasters and Bakers.
Hill-Whitney Aluminum Co., Boston, Mass.
Shepard, Sidney & Co., Buffalo, N. Y.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Ct.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence School, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Pocock, O., Cincinnati, O.
Poormau Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
Toledo Mach. & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N
Whelan, Dennis J., Troy, N Y.

Sheet Metal Work.
Willis Mfg. Co., Galesburg, Ill.

Sheets, Iron and Steel.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Pheips, Dodge & Co., 11 Cliff St., N.Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia Pa.

Sheets, Galvanized.
Ætna-Staudard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Burden, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Skylights.
Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.
Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Sheurs.
Whelan, Dennis J., Troy, N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sauborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties Manufactured.
Burrows, F. S., 107 Beekman St., N. Y.

Specialties Sheet Metal.
Vogel, Wm. & Bros., Brooklyn, N. Y.

Statuary, Sheet Metal.
Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.
Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.
McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.
Hoffman, Geo. W., Indianapolis, Ind.

Stove Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Berger Bros., Phila., Pa.
Martin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.
Parks & Parks, Troy, N. Y.

Stove Putty.
Connors, Wm., Troy, N. Y.

Stove Repairs.
Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.
Mersick, C. S. & Co., New Haven, Ct.

Stoves and Ranges.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Bussey & McLeod Stove Co., Troy, N.Y.
Charter Oak Stove & Range Co., St. Louis, Mo.
Clark, Chas. E., Chicago, Ill,
Cole Mfg. Co., Chicago, Ill.
Eclipse Stove Co., Mansfield, O.
Graff & Co., 208 Water St., N. Y.
Hess, Snyder & Co., Massillon, O.
Magee Furnace Co., Boston, Mass.
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Somerset Stove Foundry Co, Somerset Mass.
Thatcher Furnace Co., 240 Water St., New York.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Clark, Geo. M. & Co., Chicago, Ill.
Reineke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Clark, Geo. M. & Co., Chicago, Ill.
Ringen Stove Co., St. Louis, Mo.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., New York.
Rochester Stamping Wks., Rochester, N. Y.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Tea Pots.
Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.
Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate. (*Mfrs. of.*)
Ætna-Standard Iron & Steel Co., Bridgeport, O
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Pheips, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Tools and Machines, Steam and Gas Fitters'.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Tubing, Brass and Copper.
Randolph & Clowes, Waterbury, Conn.

Valves.
Eastwood Wire Mfg. Co., Belleville, N. J.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.
Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.
Littleford Bros., Cincinnati, O.
Marston, I. G. & Co., Boston, Mass.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co, 47 Dey St., N. Y.
Pock Bros. & Co., New Haven, Conn.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

Zinc, Sheet.
Pheips, Dodge & Co., 11 Cliff St., N. Y.

SEE ALPHABETICAL INDEX, PAGE 63.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A first-class PATTERN FITTER; give references. "Stoves No. 124," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

Young man as CLERK in hardware store. Address, giving age, experience and salary expected, "R W.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

At all around METAL WORKER; make estimates from plans, tin work, slating, galvanized iron and furnace work; good mechanic and hustler. "Tinner," General Delivery, Kansas City, Mo. Dec. 4

SALESMEN to sell as side lines to the hardware, stove and house furnishing trade several good selling, desirable specialties; liberal commission; mention territory; references exchanged. "H.," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Dec. 4

At once a double entry BOOKKEEPER, lady preferred, who is acquainted with the heating and plumbing business; location 30 miles from Boston, in a town of 10,000 inhabitants; state references, experience and wages expected. "G. W. J.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 27

A good TINSMITH and PLUMBER; steady job at $2 per day for a good man; none other need apply. J. E. Johnson, Geneseo, N. Y. Nov. 27

SITUATIONS WANTED.

Practical MACHINIST and STEAM FITTER; will take charge of erection of steam or hot water heating plants or power work; temporary or permanent engagement; expert in estimating costs, drawing plans, taking charge of erecting new work or making repairs and correcting defective systems; moderate wages; best of references. "Mechanical," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

As SALESMAN with some good firm selling stoves, ranges, furnaces, tin plate, metals, stamped ware and gasoline stoves; long experience; good reference. "Ohio," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By a SALESMAN with some good house to represent a line of hardware, tinware or house furnishing specialties; can speak German and English; long experience "Road, 1898," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By a young man 19 years of age as TINSMITH in some country shop; has had about four years' experience at tinning, pump and stove work; has also worked at plumbing; can furnish references; reasonable wages expected. Roscoe Batey, P. O. Box 99, Patchogue, L. I. Dec. 4

By a thorough experienced MANAGER, BOOKKEEPER and TRAVELING SALESMAN; has had 20 years' foundry experience; unexceptionable references. "Alexandra," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Dec. 4

Steady position by a thorough first-class PLUMBER; neat lead and brass worker; can do tin work if necessary. "K," P. O. Box 99, Monticello, N. Y. Dec. 4

By a strictly first-class MODELER and CARVER for stove pattern or architectural work; can work in clay, plasteline, wax, wood, plaster and white metal; good ornamental designer. "Modeler," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

As SUPERINTENDENT or FOREMAN of a stove foundry; capable of taking charge of whole or any part of plant; willing to work for a reasonable salary; best of references. "A1," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By an experieced architectural, ornamental and figure MODELER and WOOD CARVER for metal stamping dies and iron works; capable of doing his own designing; references given. M. Foderberg, 290 Pleasant avenue, New York City. Dec. 4

By a first-class CORNICE and SHEET METAL WORKER; 18 years' experience at all branches of the trade; considered a fast workman; can work from drawings and get out own patterns; best of references as to workmanship and character; prefer Southern States. "Tinner," 7710 Wallace street, Chicago, Ill. Dec. 4

A SALESMAN who calls on the hardware trade in the coal fields of Pennsylvania would like to get in communication with a good tinplate house to sell their goods as a side line; can do a fair business from the start for them; name commission; good reference given if desired. "A. B. C.," General Delivery, Wilkes-Barre, Pa. Dec. 4

As SALESMAN for furnaces, steam and hot water heaters; six years on road in West; am practical tinner; strictly temperate; middle aged; first-class references; open for position on the road or as resident salesman and foreman or bookkeeper. "Practical," 1742 South Twenty-eighth street, Omaha, Neb. Dec. 4

By young man 35 years of age (a hustler) as TRAVELING SALESMAN; 14 years' experience on the road for stoves and tinware; have traveled Pennsylvania, Delaware, Maryland, Virginia, West Virginia and Washington, D. C. "Hustler," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By a practical DIE and TOOL MAKER as foreman or superintendent; familiar with typewriter, sewing machine, clock and bicycle work; have had experience at the bench, drawing board and as superintendent; can handle men with good advantage and good results; age 30; can accept January 1, 1898; best of references. "H. R.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

An experienced stove, furnace and boiler TRAVELING SALESMAN is open for an engagement for '98; large trade acquaintance in Central and Eastern States; A1 references from leading manufacturers; speaks the German language fluently. "N. F. E.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

A position as ASSISTANT BOOKKEEPER or OFFICE and SALESROOM ASSISTANT by a young man who has had experience in the furnace, plumbing and steam and hot water boiler wholesale and retail trade; permanent position desired; satisfactory references can be furnished. "Qualified," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

A SHEET IRON and TIN WORKER, first-class and experienced in every branch of the trade, including estimating, designing and cutting, would like a steady situation; is 50 years of age; sober and reliable; can act as salesman, &c., if necessary. Address till January 1, "Guarantee," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

As a local or traveling SALESMAN with a wholesale jobbing house in the plumbing, gas and steam fitting line by January 1, 1898; references as to honesty and ability. "J. A. B.," 156 High street, East, Detroit, Mich. Dec. 4

As resident or traveling SALESMAN or FOREMAN with a stove and furnace house; experienced in heating, ventilating, estimating, contracting and managing help; have an acquaintance in New York State. "J. B. L.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By a practical PLUMBER of 20 years' experience; strictly temperate and licensed W. Breatt, 298 Hamlet street, Fall River, Mass. Dec. 4

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As SUPERINTENDENT or FOREMAN of a foundry making stoves, furnaces or water heaters, by a man who is an expert molder and has filled positions as manager for many years in leading foundries with the best of results: reference. "W. Y.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By an all around TINSMITH, good at heater work and general jobbing; some knowledge of plumbing. G. Dutcher, 209 Main street, Poughkeepsie, N. Y. Dec. 4

Steady position by a young man 30 years of age, who is a first-class PLUMBER and can do all kinds of tinning, steam and hot water heating—in fact, has been used to all branches of the trade. E. Palmer, 162 Main street, Norwalk, Conn. Nov. 27

AS FOREMAN in stove pattern shop, drafting, designing and carving; first-class pattern maker; 12 years' experience as foreman; best of references furnished. "W. B. B.," office of *The Metal Worker*, 232-238 William street, New York City. Nov. 27

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By a TINNER a steady position; will work for moderate wages; has had 12 years' experience in general jobbing, in and outside work; can furnish good reference. W. E. Benninger, Garrett, Ind. Nov. 27

By a first-class PLUMBER; both lead and brass worker; furnaces, roofing, gas fitting; also do some hot water heating; A1 references; estimate on all kinds of work; 15 years at business. A. J. Lawreuce, Station A, P. O., South End, Boston, Mass. Nov. 27

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The stockholders of the JOSEPH BELL STOVE & RANGE COMPANY have passed an order to sell their plant and equipment and stocks of material and manufactured stock at public sale, on Wednesday, the 5th of January, 1898, on the grounds of the company at MUNCIE, IND.

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The entire property, including all stock on hand at day of sale, materials, patterns, tools and equipment and good will, will be sold in one lot. Sale to take place on the grounds of the company, at MUNCIE, IND., on Wednesday, the 5th January, 1898.

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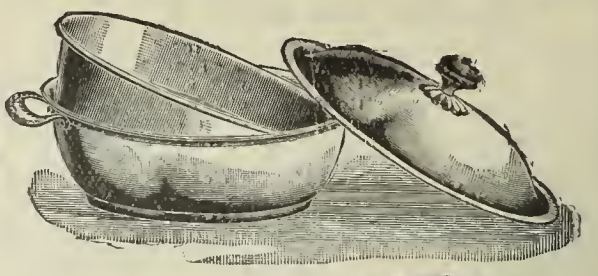

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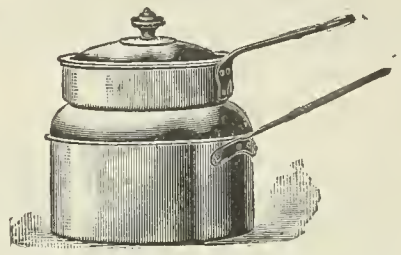

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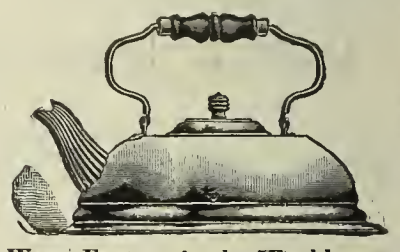

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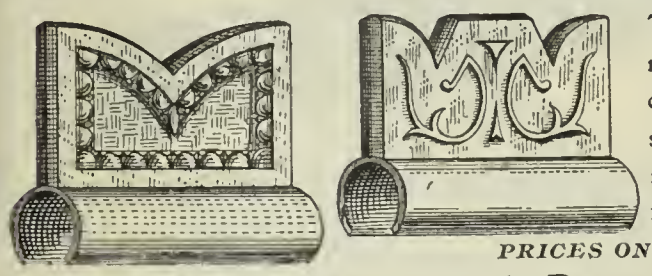

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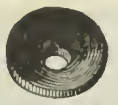

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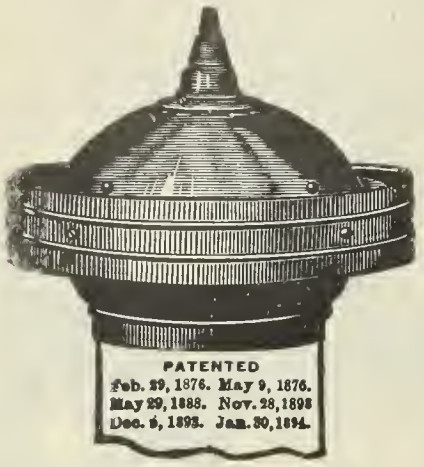

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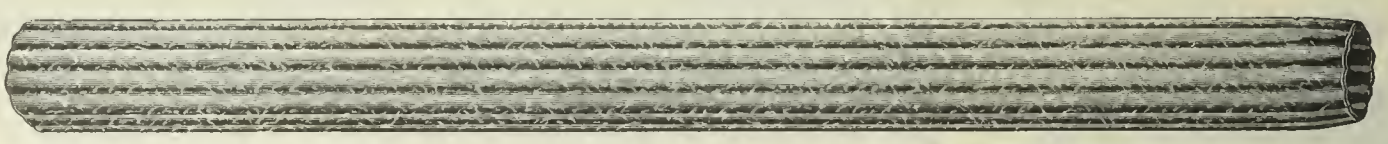

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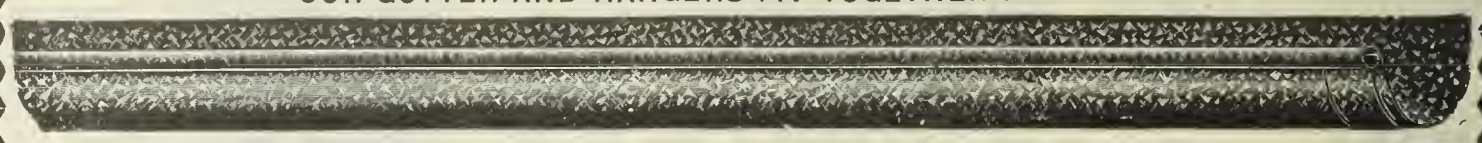

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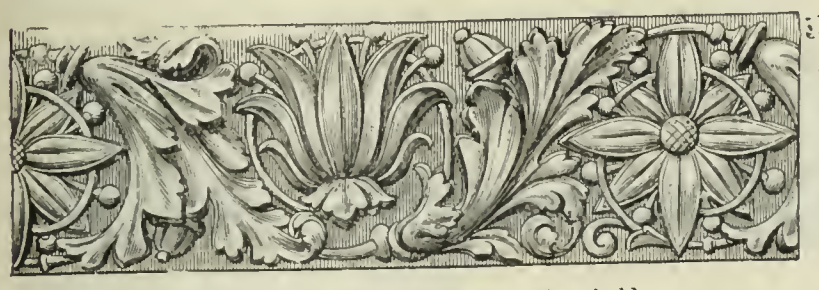

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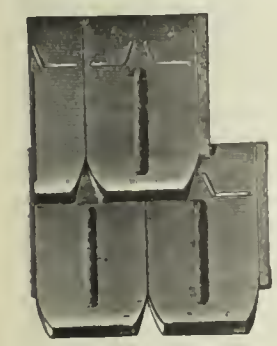

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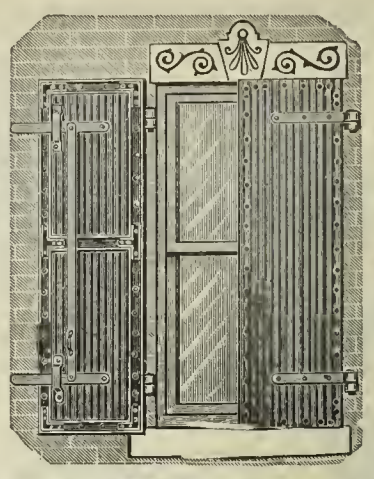

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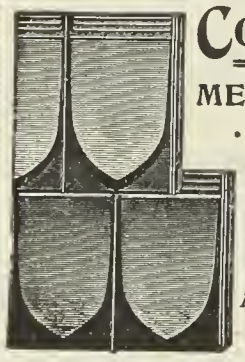

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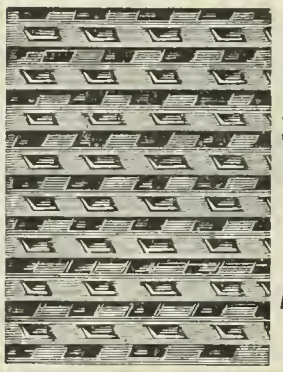

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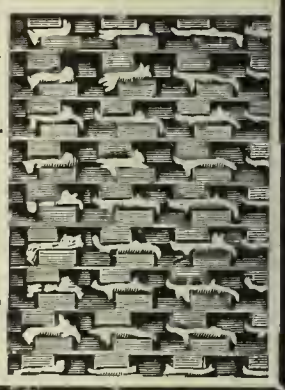

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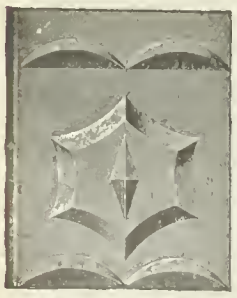

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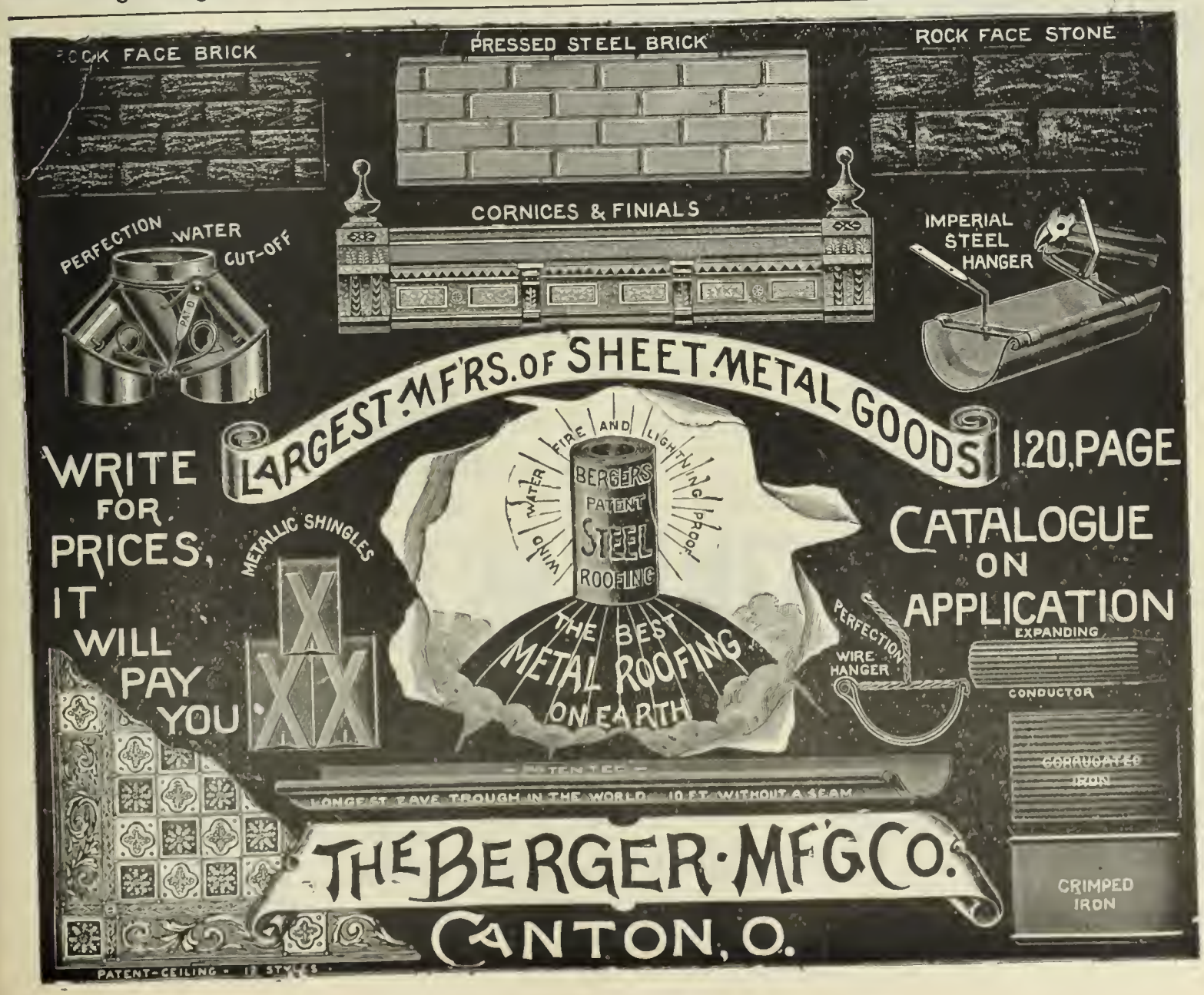

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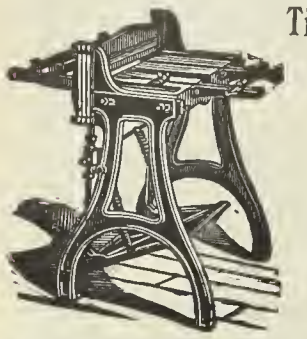

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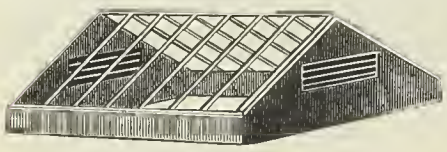

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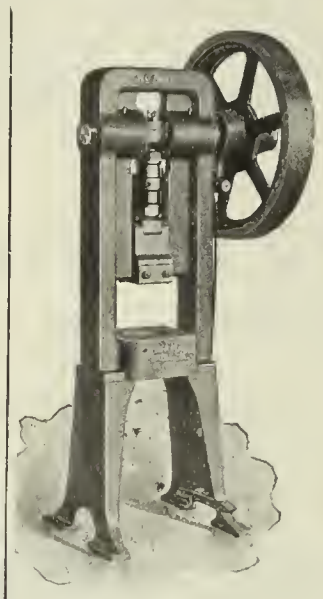

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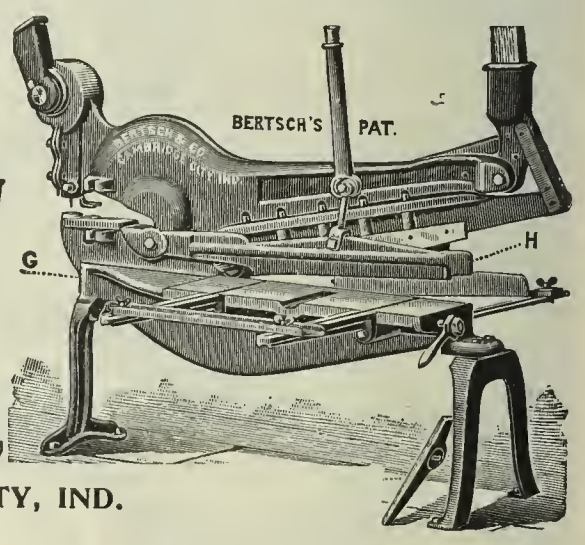

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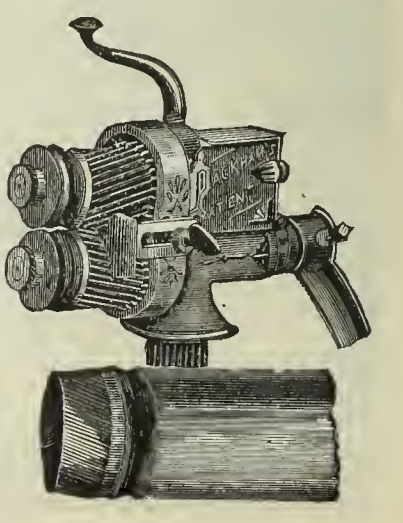

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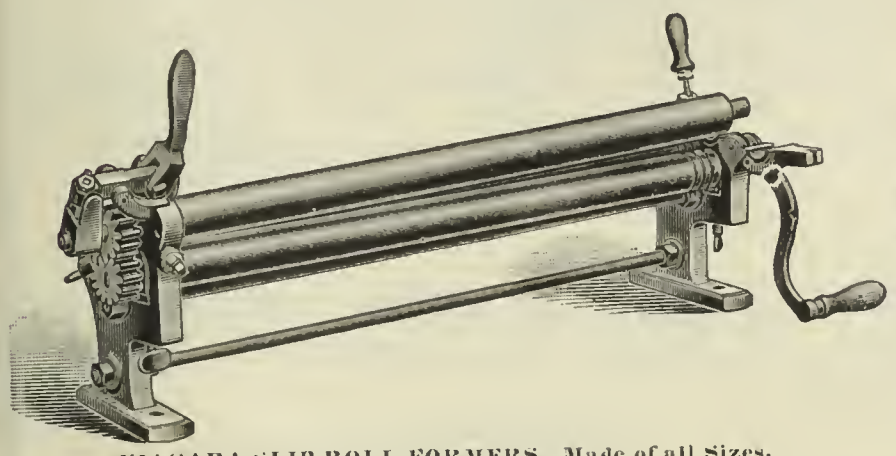

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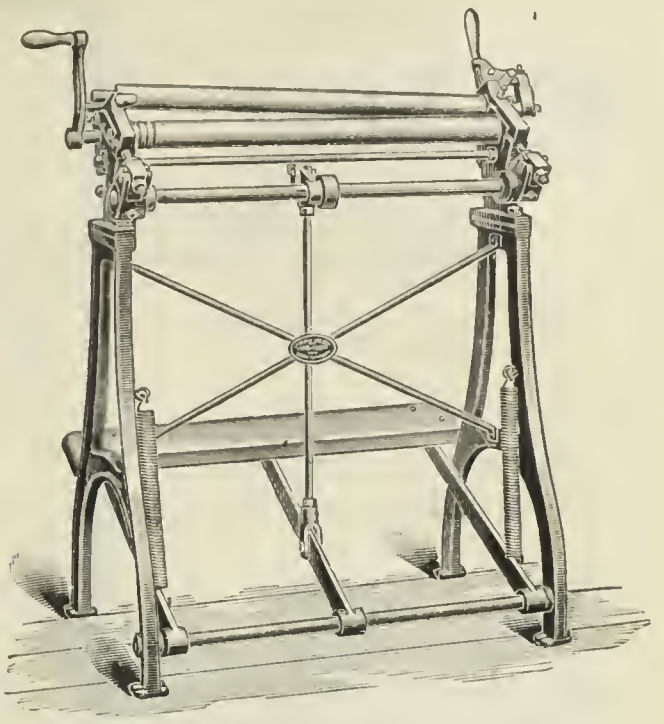

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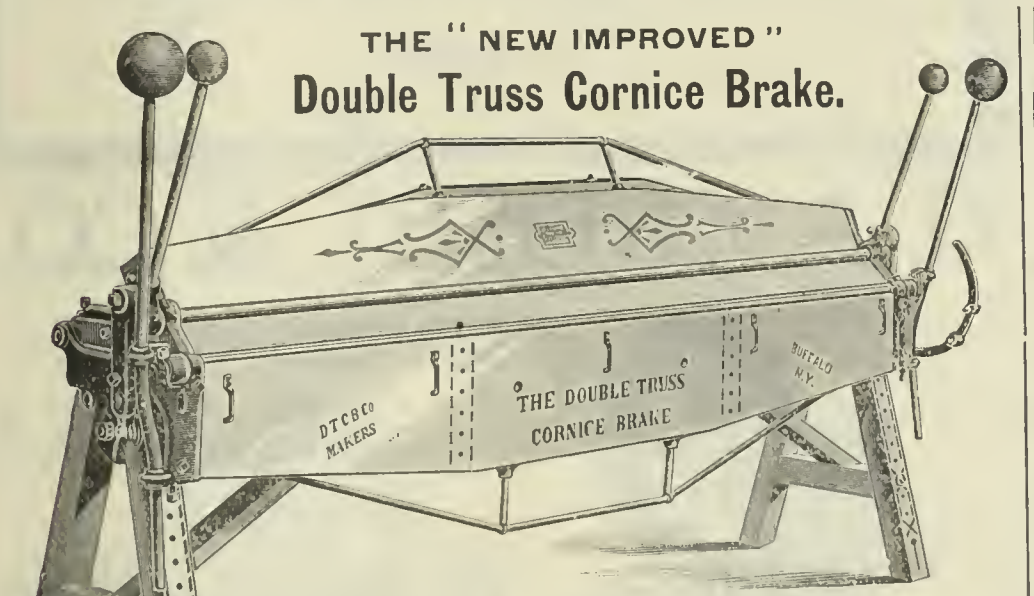

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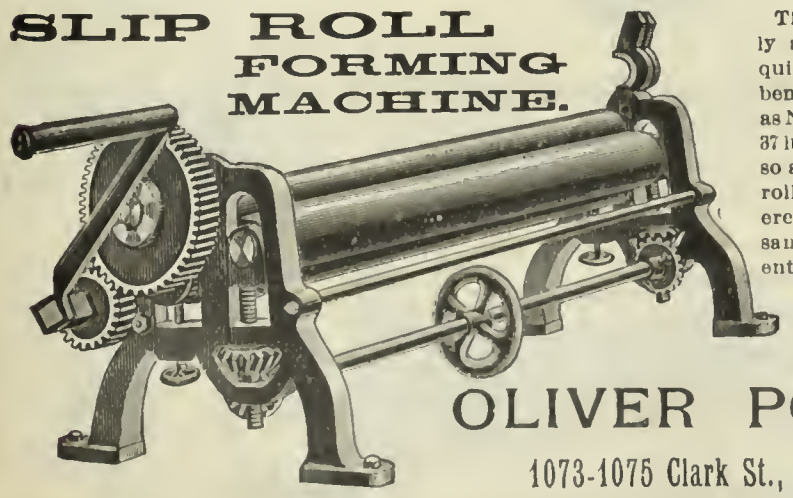

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"Yes," the old gentleman replied, "I do sort of like it. That's a powerful ugly lookin' beast thar, and I swon I don't know's I blame Gérôme very much for gittin' out of the way."

"Getting out of the way?" repeated the proprietor. "What do you mean by that?"

"Why," the visitor explained, "it says 'Lion after Gérôme,' don't it? Well, Gérôme ain't nowhar' to be seen, so I s'pose he must be hidin' behind one o' them stuns."

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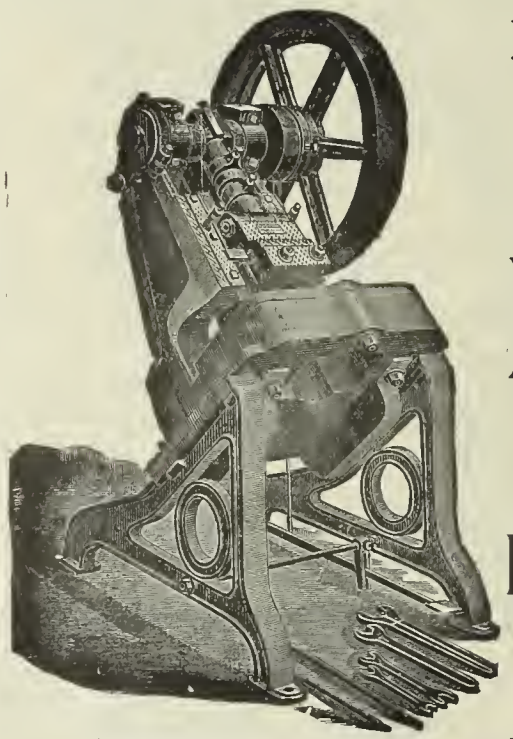

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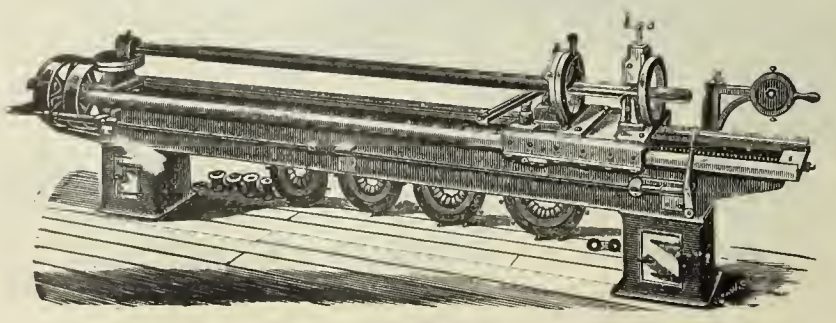

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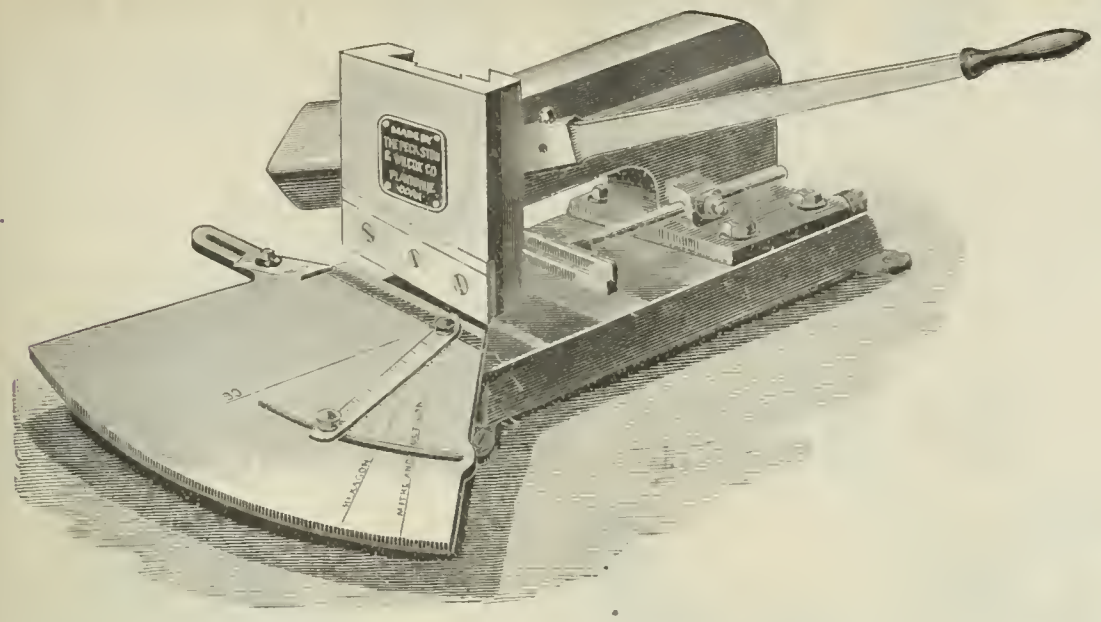

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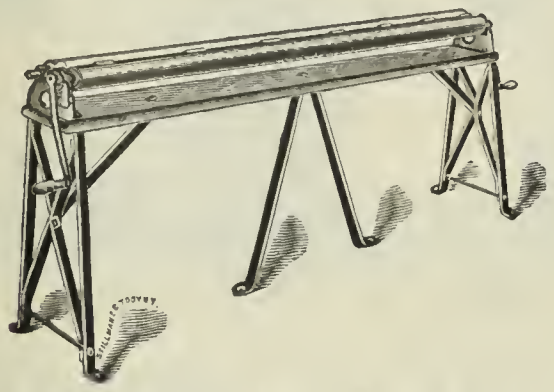

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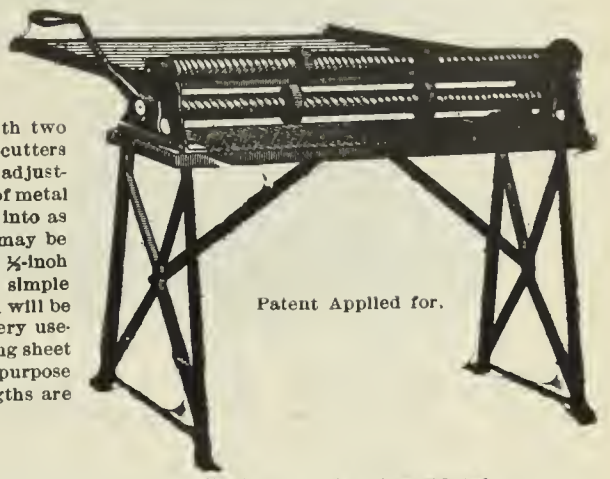

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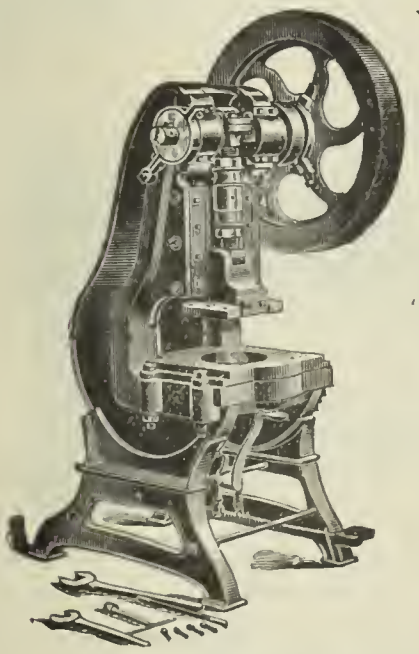

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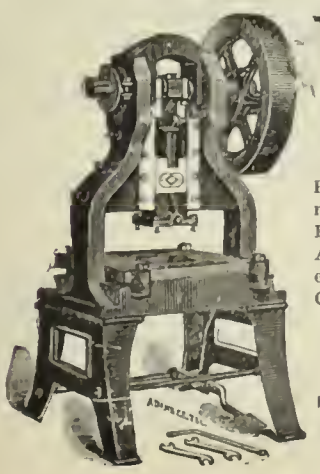

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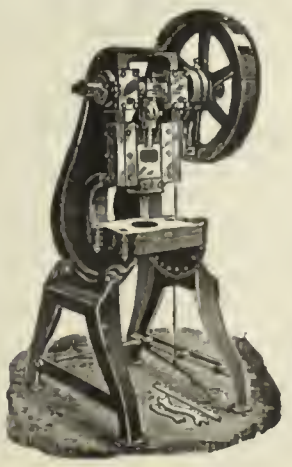

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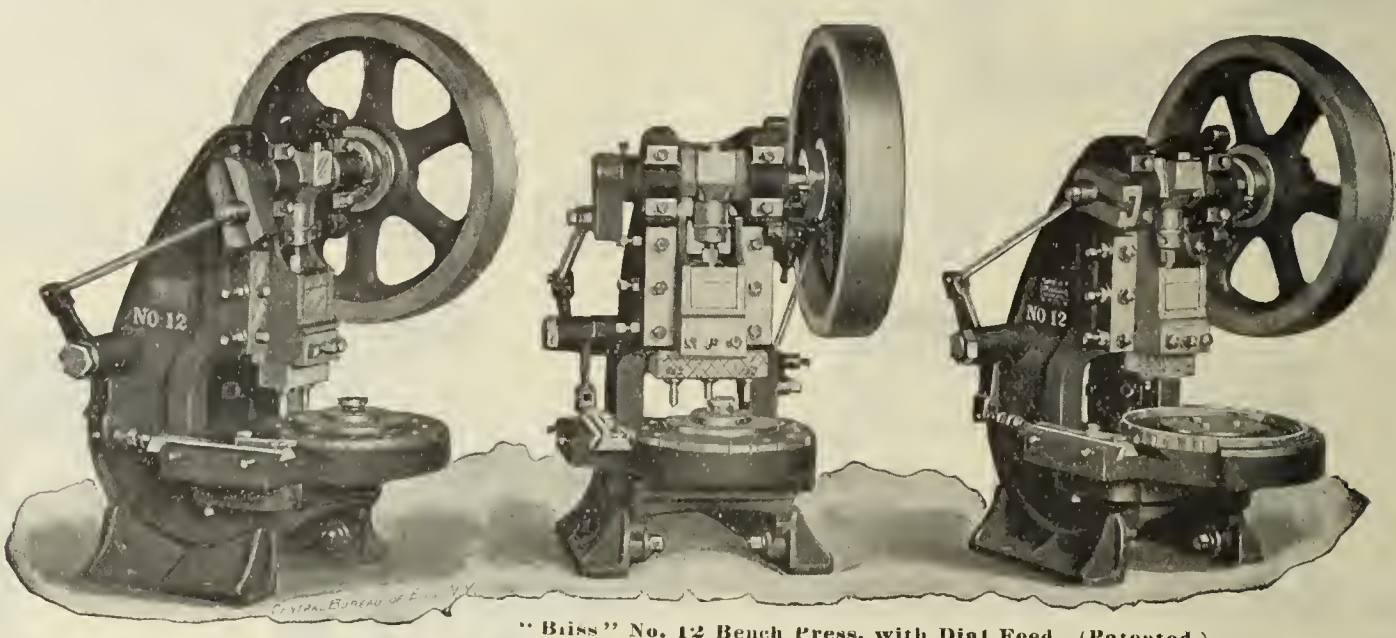

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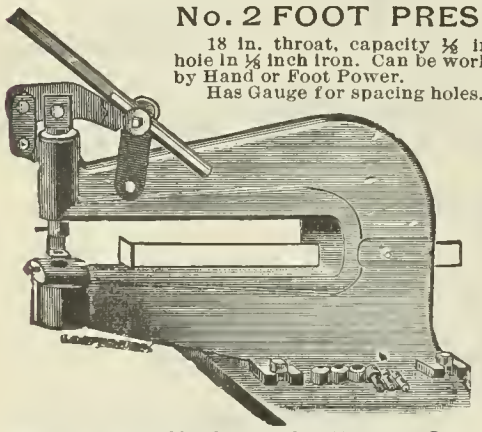

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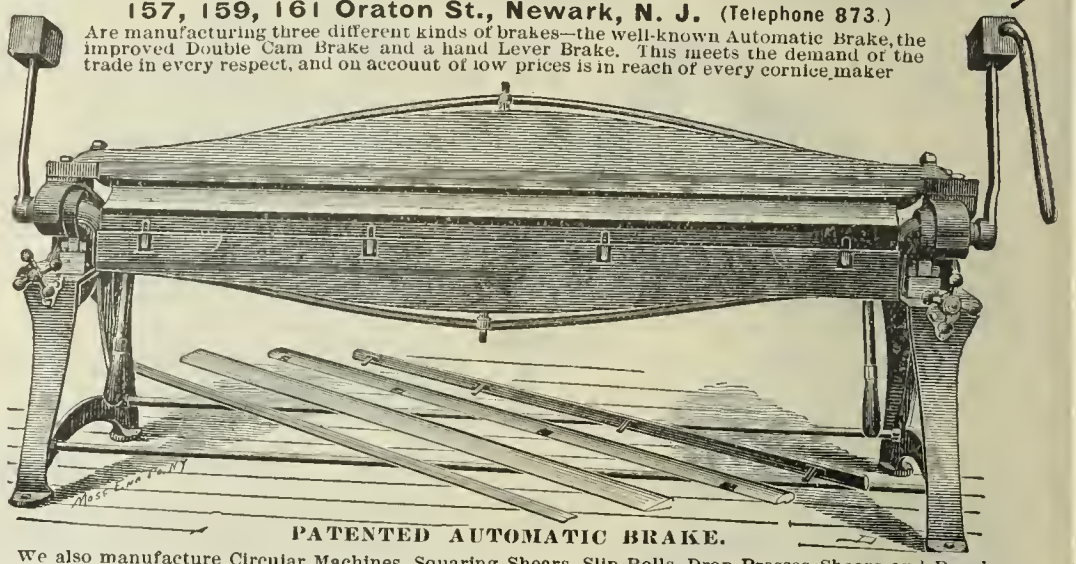

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"How do you spell that word, sir?" he inquired.

"P-a-j-a-m-a-s," spelled the Representative slowly, and added: "Didn't you ever have to write it before?"

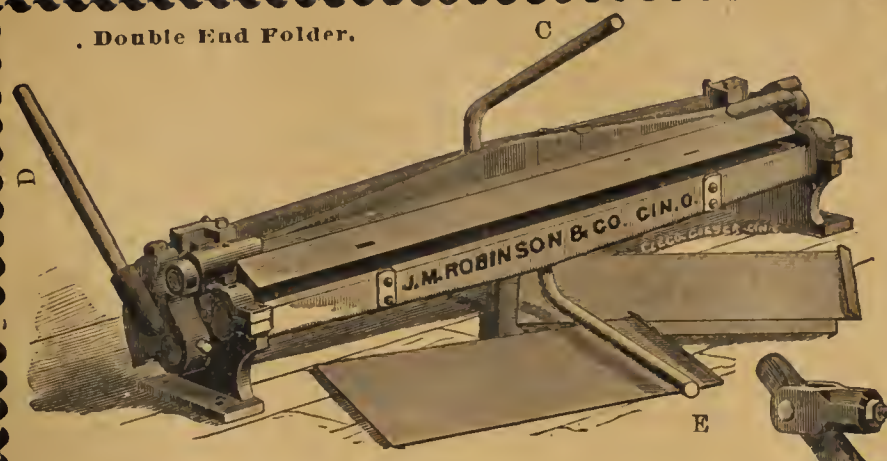
"No, sir."

"In that case, I'll bet you a dollar you don't know what it means."

"I don't bet, sir," he hesitated, "but I guess I know what it means."

"Well, what is it?"

"It's French for whiskers," and the Representative, in the kindness of his heart, smiled sweetly and told the young man he had guessed it the very first time.—*Washington Star.*



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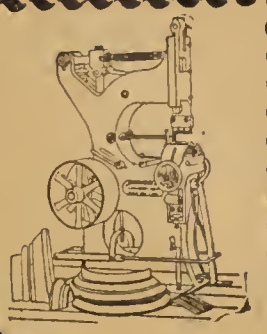

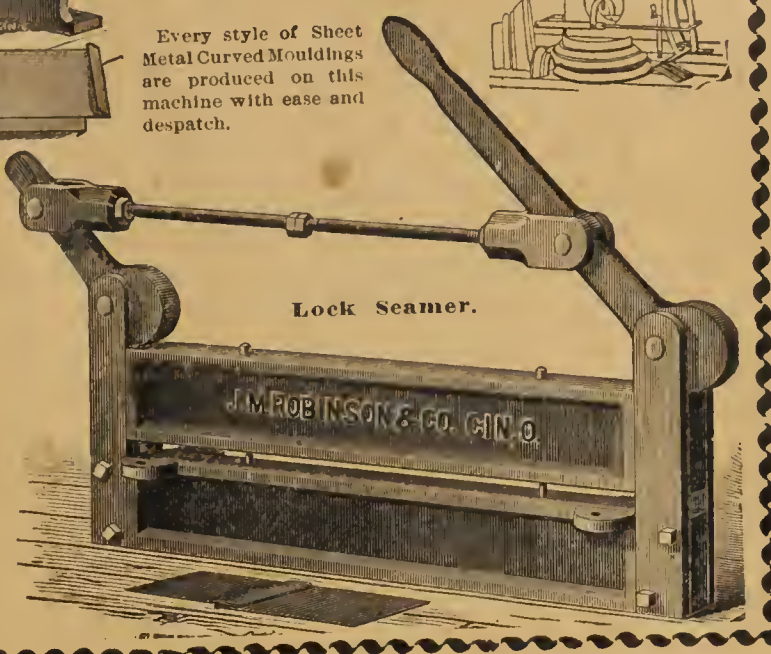

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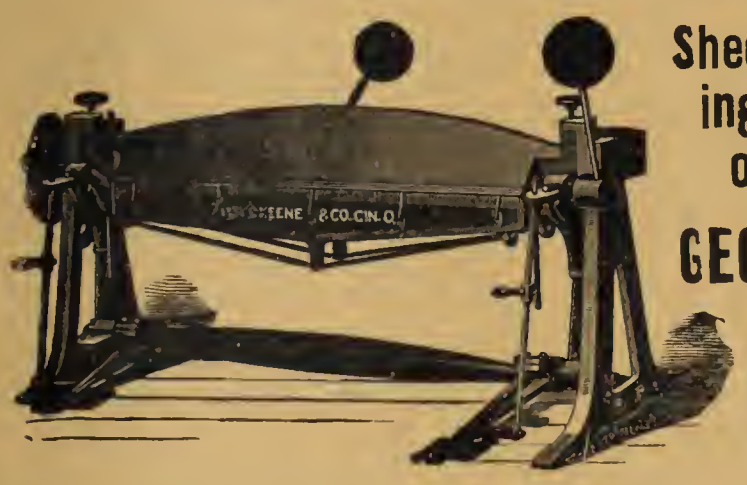

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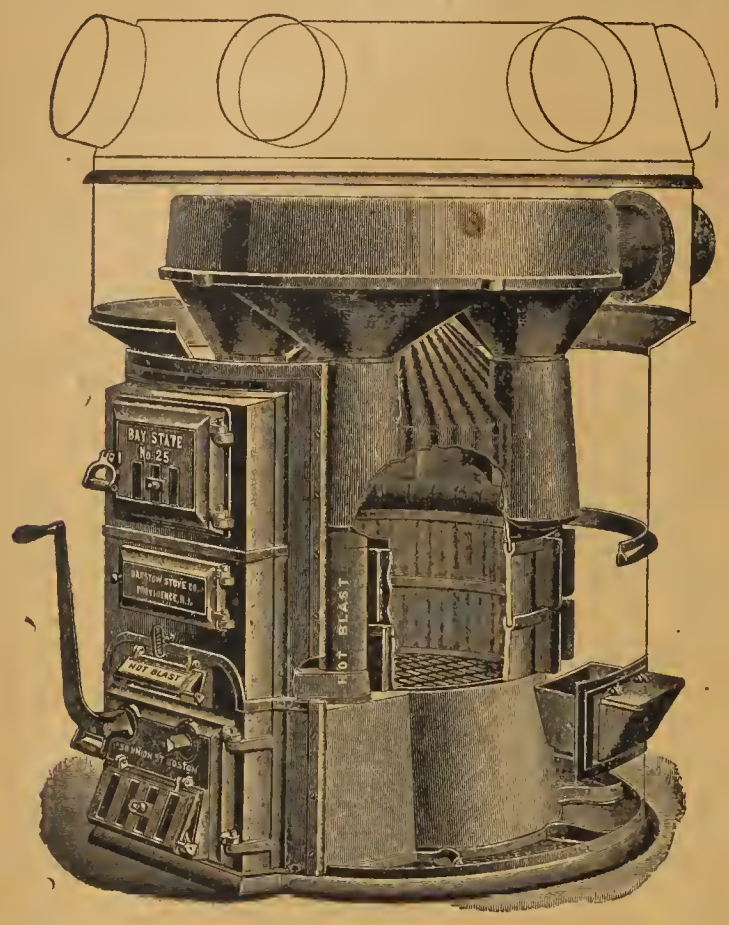

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This brand of Tin was selected by the U. S. Government over all Competitors.

The trade will recall that another brand was used for this roof only a few years ago.

N. & G. TAYLOR CO.
SOLE MANUFACTURERS, PHILADELPHIA.

THE GREAT CHURCH LIGHT REFLECTORS FOR OIL, GAS OR ELECTRIC LIGHT
I. P. FRINK, 551 PEARL ST. N.Y.

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Bulllit Building, Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Allentown Iron Co.
Warner & Co.'s Wash Irons.
Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK
TINNERS' TOOLS and MACHINES,
TINNERS' SUPPLIES.
186, 188 & 190 Water Street, and
248 & 250 Pearl Street.
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UTICA PIPE FOUNDRY CO.

CAST IRON PIPE and SPECIALS for WATER and GAS. Also Flanged Pipe and Fittings, Hydrants, Gates, Pig Lead, etc. CHAS. MILLAR & SON, Selling Agents, Utica, N. Y. Manufacturers of Lead Pipe and Plumbers' Materials. Wholesale Eastern Agents Akron Vitrified Sewer Pipe.

W. Dewees Wood Co. McKeesport, Pa
Sole Manufacturers of Woods Smooth Iron
Patent Planished Sheet Iron

Good Judgment

and Common Sense in a large degree is displayed by the stove dealer who refuses to deal in varieties and job lots, but wisely decides that whatever of money or talent he may have, it shall be expended to further the sale of ONE good reliable line, one sure to bring future business.

That man should handle the

GLENWOOD.

Write the Weir Stove Co., Taunton, Mass.

HEATER PIPE TIN.

We have the following sizes in stock :

IC & IX, 20 x 26, for 8 in. pipe.
IC & IX, 20 x 29½, " 9 in. "
IC & IX, 20 x 32½, " 10 in. "
IC & IX, 20 x 35¾, " 11 in. "
IX, 20 x 39, " 12 in. "
"Cupola" Brand.

Superior quality and finish. We invite correspondence before buying.

McCLURE & CO.,

PHILADELPHIA, 115 North 7th St.
PITTSBURG, PA, 211—213—215 Second Ave.

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Index to Advertisements, Pages 60 - 62

The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. XLVIII. NUMBER 24. | NEW YORK AND CHICAGO, DECEMBER 11, 1897. | ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

American Seal.

Stove Putty, Asbestos Furnace Cement, Stove Lining, Elastic Oil Roofing Cement.

Put up specially for Jobbing trade in Neatly Labeled Cans.
For full information write to

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The "Gorton Side-Feed" Boilers

WILL BURN HARD OR SOFT COAL.
You Want the Best. We Have It.
SEND FOR CATALOGUE AND INVESTIGATE FOR YOURSELF.
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197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

Diamond Thimbles. S. CHENEY & SON, Manlius, N. Y.

EASTWOOD VALVE.
EASTWOOD WIRE MFG. CO., Belleville, N. J.

THERE IS NOTHING
so hard as trying to build up a paying and lasting business selling furnaces and ranges that don't pay and don't last.
The business that is built up by selling Paragon Furnaces and Excelsior Ranges lasts always and remains profitable as long as it lasts.
ISAAC A. SHEPPARD & CO.,
PHILADELPHIA, PA.

TRADE APOLLO BEST BLOOM MARK

APOLLO WORKS EASY.

A galvanized-iron job—any job—is easiest done with perfect iron; difficult work especially.

Time is money, and doubt is money too.

You can always get what you want of Apollo promptly.

Is there any good reason for ever using poor iron?

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Copper Range Boilers.

We furnish these tested to 200 pounds and guaranteed against collapse, and for use under heavy pressure. They cost a little more than iron, but are not only more durable but have a value as old copper which is a handsome percentage of cost.

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TAUNTON, MASS., Manufacturers of FIRE BRICK LININGS.

Water Seal Automatic Air Valves.
Back Pressure Valves, Pressure Regulating Valves, Radiator Valves, Steam Traps, Pump Governors.
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Pump Governors, Steam Traps, Steam and Water Reducing Valves, Tank Temperature Regulators, Noiseless Back Pressure Valves, Water Arches, and Oil Separators. Controller.

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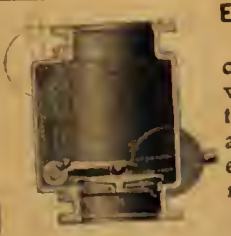

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This valve has no dash pots, springs, guides or complicated levers to get out of order. It is simple, reliable and well made. Never sticks, and can be relied upon at all times when using exhaust steam for heating; or when used as a relief, or free exhaust on a condensing plant, it has no equal. It is noiseless and free from any complicated attachments.

JENKINS BROTHERS, New York, Philadelphia, Boston, Chicago.

SEE THE MAGEE Advertisement PAGE 10.

QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL THAT'S WHAT THEY ARE. QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL

QUICK MEAL

STEEL RANGE.

QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL

Carton

Hot Water & Steam Boilers & Furnaces.

Notice the

CROWN SHEET

with large

FIRE SURFACE,

a feature of this Heater.

Made in 2 PIECES with

LOCK NUT

Nipple Connections.

All Vertical Circulation.

Send for our GOLDEN JUBILEE Anniversary BOILER CATALOGUE,

1847-1897.

If interested in Hot Air Furnaces and Combination Heaters—we make a most complete line—and you should send for our New Furnace Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *50 Years,*

UTICA, N. Y.

Warm Air Furnaces (Thirteen Patterns).

Combinations (Six Patterns).

Steel Tubular Steam Heaters.

Hot Water Heaters (Three Patterns).

600 DEALERS SELL THESE HEATERS.

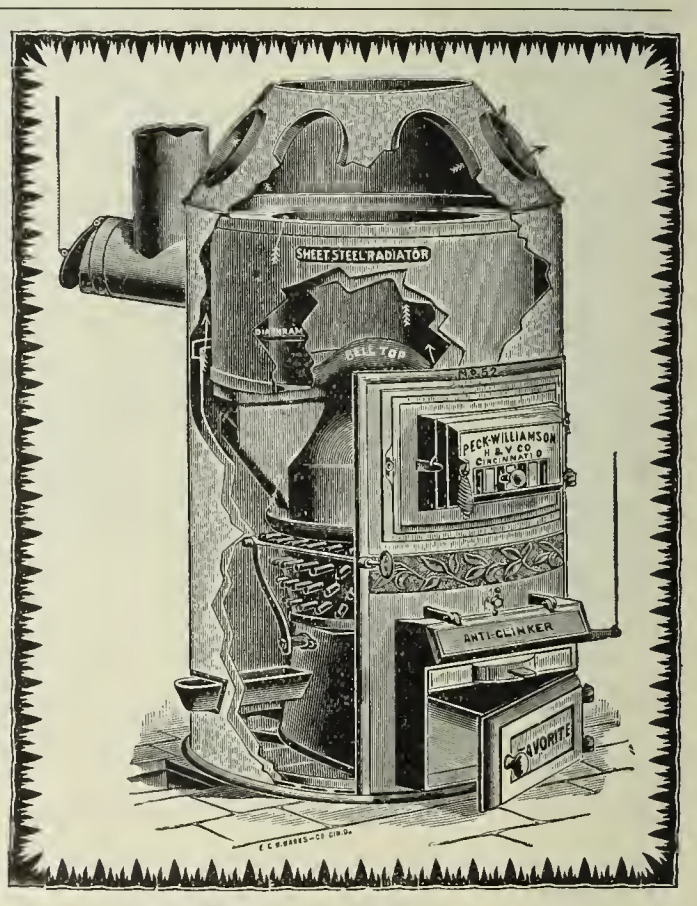
FOR Hard Coal, Soft Coal, Lignite, Coke or Wood.

Before selecting a line of apparatus to sell in 1898 ask for our prices and Catalogue—we can interest you.

J. F. PEASE FURNACE CO.,

SYRACUSE, N. Y., and CHICAGO.

Without a Defect



The Favorite Furnaces are so recognized and endorsed everywhere because ***they are***. Our agents have never had to take one out or substitute another make. They are constructed on honor, and to use them is to attain that satisfaction in a heating apparatus so essential but difficult to obtain. Can't you place one or more in your vicinity? We ship same day order is received. There's money in it for you, Dealer.

The Peck-Williamson Heating & Ventilating Co.

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Save Your Coal. Save Your Coal.

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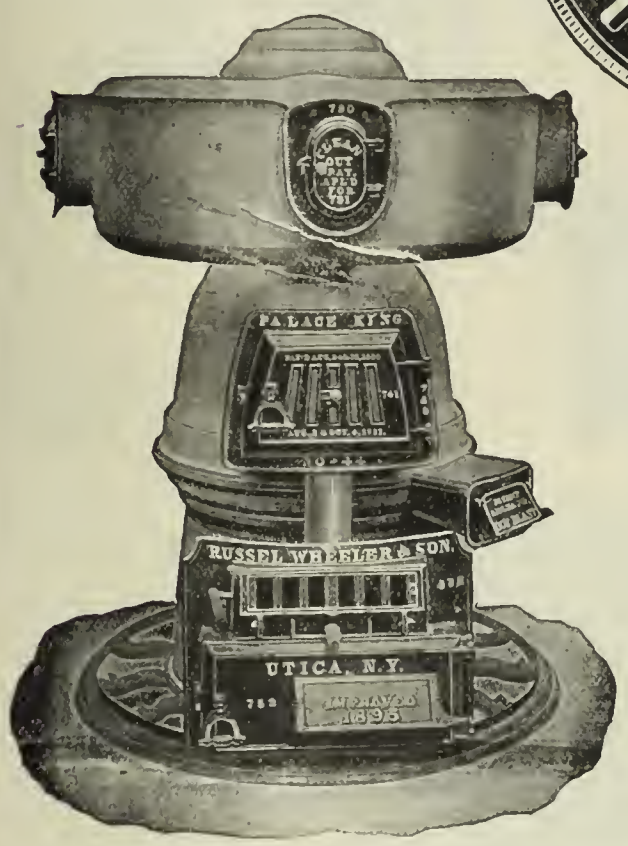
Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.



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SAVE YOUR COAL.

You can Save Coal, and Money too, by using our Heaters.

THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

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221 SOUTH FIFTH STREET,
PHILADELPHIA.

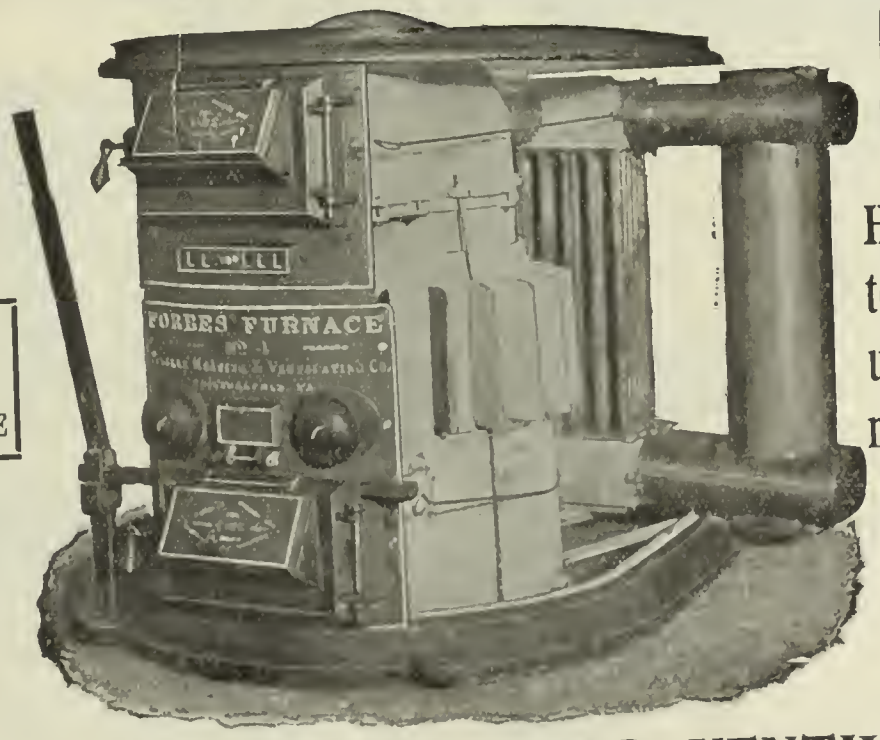
HATBORO, PA., Dec. 26th, 1896.

MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.

MY DEAR SIR:

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal

Very truly,
I. N. EVANS.



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HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

TUBULAR HEATING AND VENTILATING CO.,

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IT WILL PAY YOU TO LOOK INTO.

8 STYLES, 32 SIZES.

Latest and most modern ideas in range construction.

Right and left hand ovens.

Surplus heat from oven utilized to heat an upper room without expensive fittings.

PROGRESSIVE GOODS FOR PROGRESSIVE DEALERS.

We want to tell you all about this line, its prominent features, its great superiority and ***its low prices.*** A postal request from you will bring you a little book which will do our talking.

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NOW IS THE TIME TO SECURE THE AGENCY FOR

The "New Process" Evaporating Gasoline Stove.

A STOVE THAT LIGHTS LIKE GAS.

A STOVE THAT IS PERFECT IN EVERY DETAIL.

A STOVE THAT IS ABSOLUTELY SAFE.

No Drip Cup to Overflow and cause trouble.

RESERVOIR CANNOT BE FILLED WHILE THE BURNERS ARE LIGHTED.

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Why have the housewife swelter in a hot kitchen, carry coal and ashes when she can have *comfort* by using a "NEW PROCESS" Stove—the *handsomest* piece of stove furniture made?

Send for Catalogue and secure the agency early.

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Hart & Crouse Co.

ROYAL HEATERS.

All Kinds of Heating Apparatus.

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Royal Heaters Lead All Others.

Sold on their Merits, not on their Antiquity.

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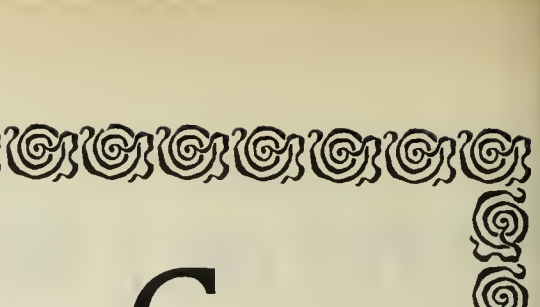

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4 Sizes.
14—16—18—20 in.

MARS ECLIPSE.
5 Sizes.
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CARBON ECLIPSE.
Air-Tight.
Sizes: 13 in., 15 in., 17 in.

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Sizes: 24 in., 28 in.

Two First-Class Oaks.

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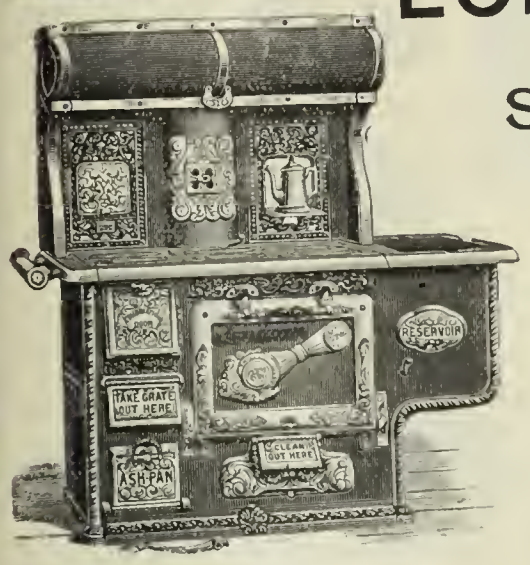

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STEEL RANGE
WITHOUT A PEER.

TWO SERIES, { Series A.—Medium Price. Series B.—Low Price.

SIX SIZES, . . . { 16 x 20 18 x 20 20 x 20 16 x 22 18 x 22 20 x 22

ALL STYLES, { Write for Steel Range Catalogue No. 14.

ALSO a complete line of Cast Ranges, Cooks and Heaters. Catalogue No. 15.

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Ranges, Hot-Air Furnaces, Fire-Place Heaters, Cook Stoves, Heating Stoves, &c.

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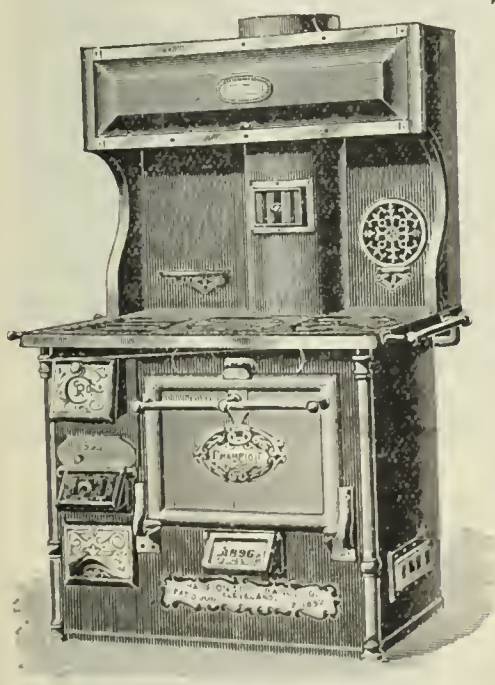

They are Wealth Producers.

Stoves were formerly considered luxuries. To-day people want something MORE SUBSTANTIAL and

The Champion and Marquart
STEEL RANGES
are the apple of their eye.

GET IN ON THE GROUND FLOOR AND PUT IN A LINE.

EASIEST SELLER YOU EVER SAW.

When once introduced will sell themselves.

Write for catalogue.

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CHICAGO STOVE & RANGE CO., Chicago,
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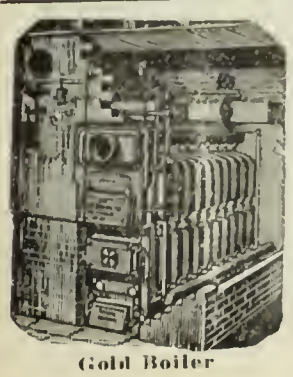
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FOR PUBLIC AND PRIVATE RESIDENCES.

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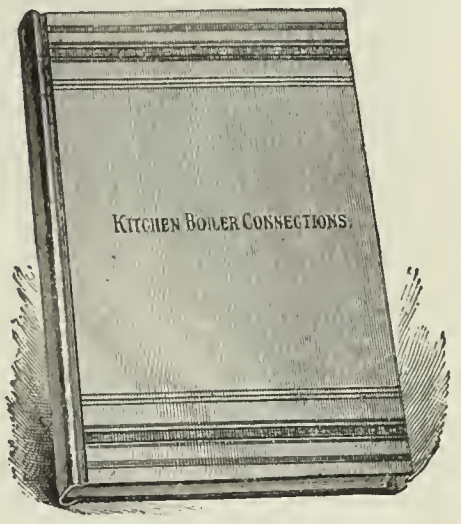

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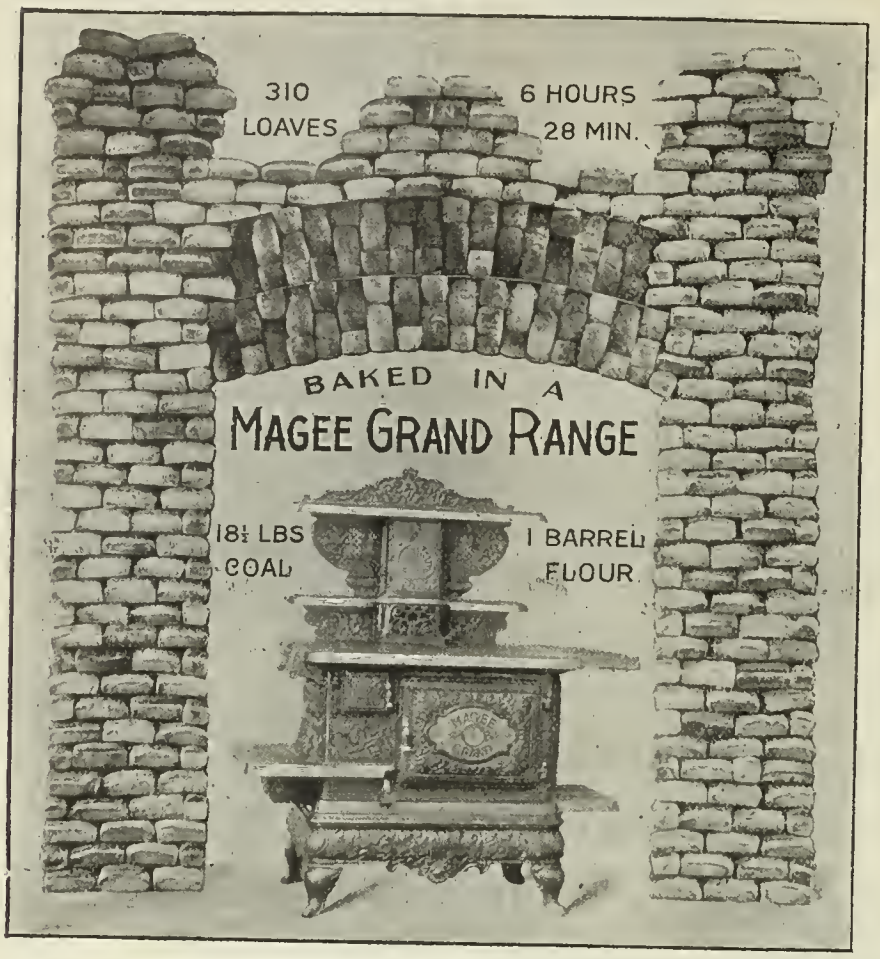

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WE INTEND YOU SHALL KNOW OF THE

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AND WHAT IT IS ACCOMPLISHING, AND THEN IF YOU FAIL TO PLACE AN ORDER, IT WILL BE YOUR OWN FAULT.

A RECORD SALE.

"A party of six ladies desired to buy six of the ***best*** Ranges that could be purchased. It is a well-established fact among salesmen that when a number of persons desire to purchase together the best article made, there are usually as many opinions as to the merits of the different makes as there are individuals, and it is a happy moment for the salesman when the majority agree. This case was an exception to the rule. ***Not one lady dissented*** from the opinion of her companions as to the superior merits of the ***Magee Grand Range,*** and each gave an order for one."

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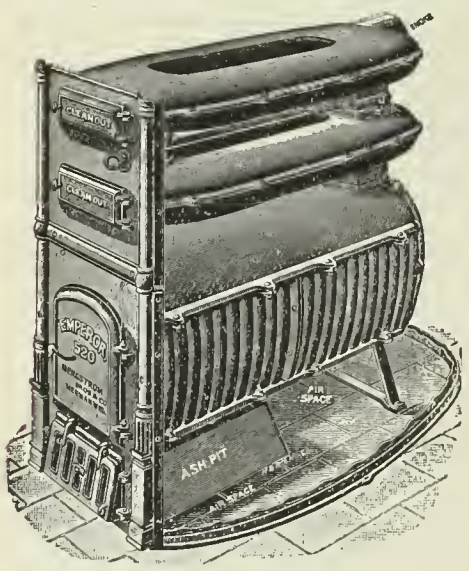
27 New Montgomery St., SAN FRANCISCO.



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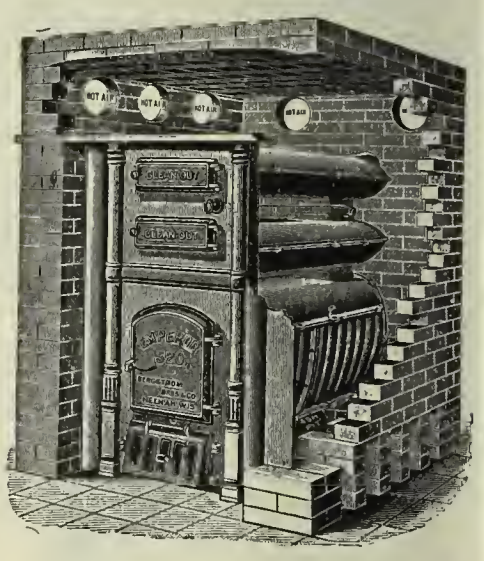

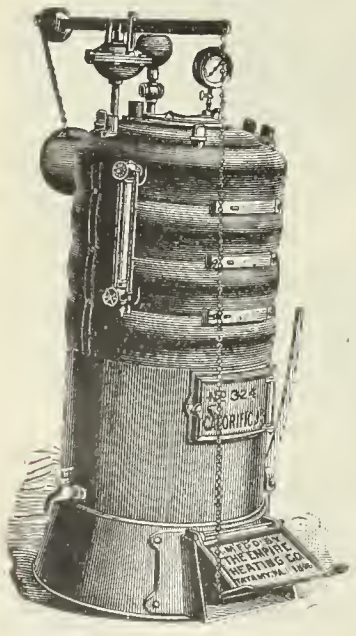

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For low pressure steam and hot water heating they have no superior. More good points than any other heater on the market. Excellent heating surface, the best grate arrangement out. It is economical, durable and convenient. Made in a large variety of sizes, suitable for all purposes. From the smallest to the largest job. Write for illustrated catalogue and prices and discount to . . . .

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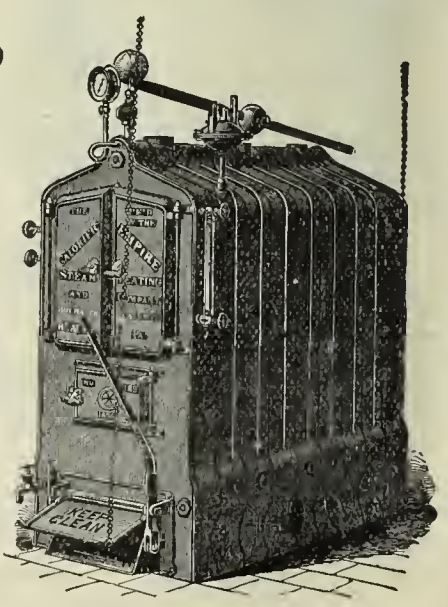

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Gurney

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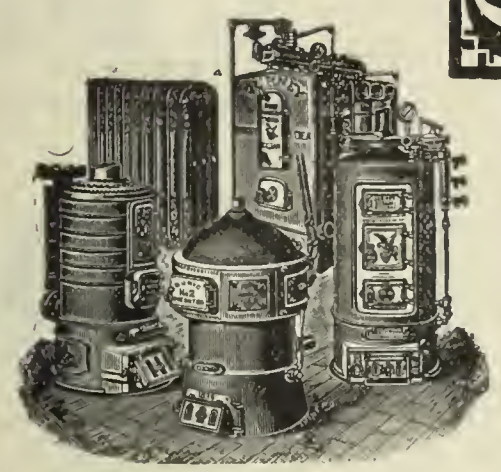

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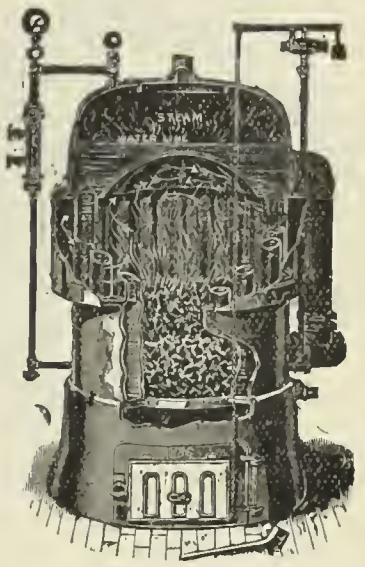

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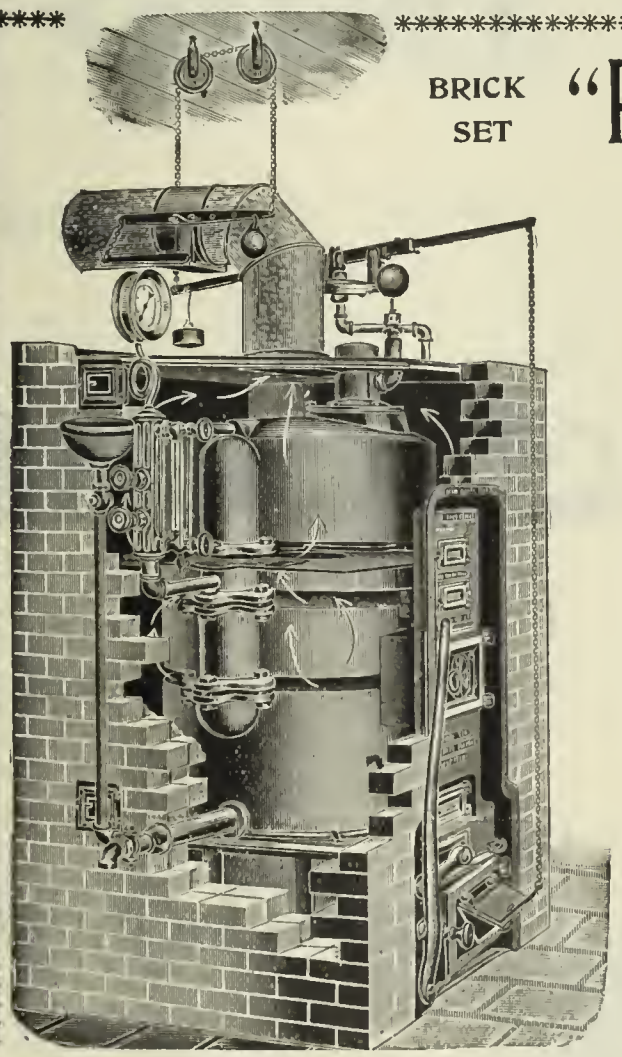
DORIC SEAMLESS TUBULAR STEAM BOILER.

CAPACITIES TO MEET ANY
...REQUIREMENT...



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Cut shows Boiler and how it is put together, from Ash Box to Steam Dome. Arrows show in which direction fire must travel to reach chimney.

A large amount of available heating surface, which can be easily reached and kept clean, makes it a very *powerful heater.*

Every boiler tested 60 lbs. cold water pressure and warranted free from imperfections. The Plummer has stood the test as an economical and practical *house warmer* for 12 years.

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HOWARD AUTOMATIC DRAFT REGULATOR

GUARANTEED.

IT ADJUSTS ITSELF TO THE WORK REQUIRED
and With Human Intelligence
GIVES EVEN TEMPERATURE, SMALL COAL BILLS, HEALTH, COMFORT.

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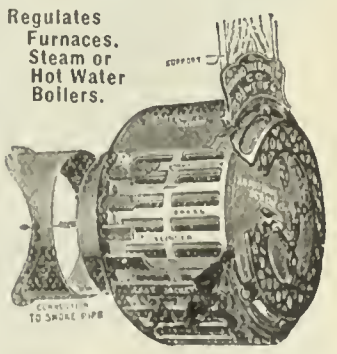

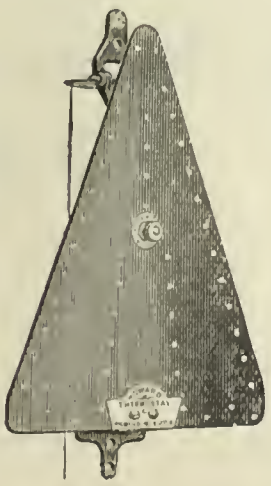

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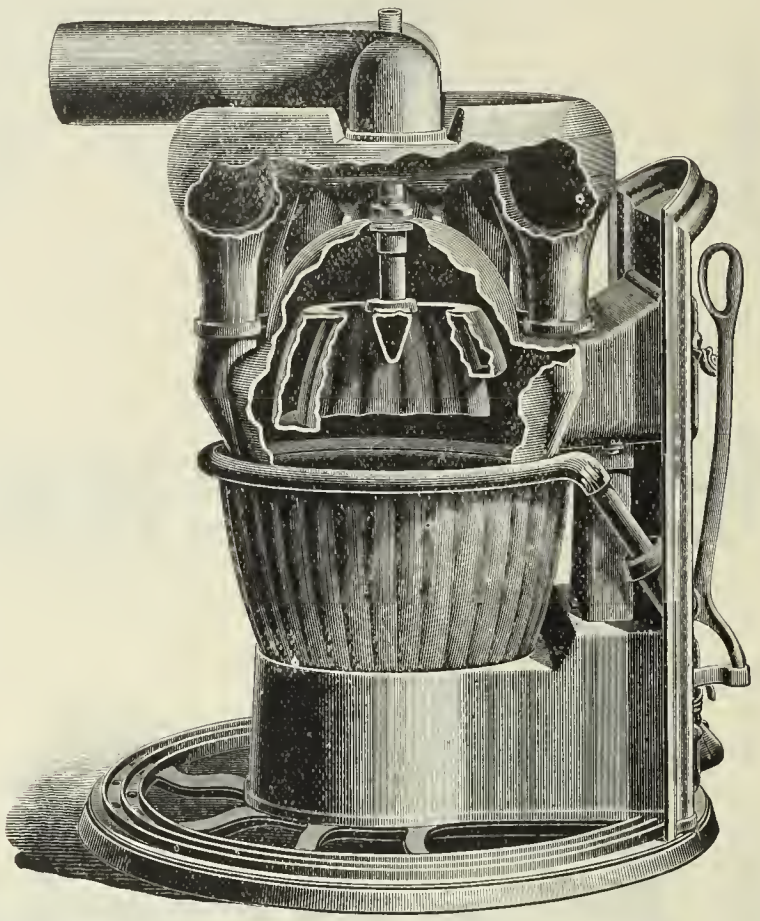

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In the above cut the castings are broken away to show the position and shape of the water heating section.

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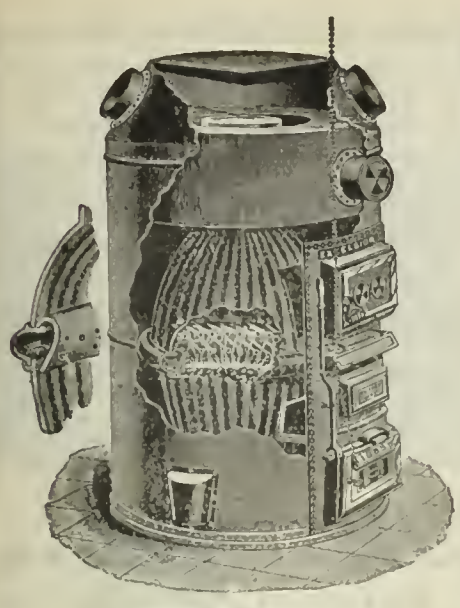

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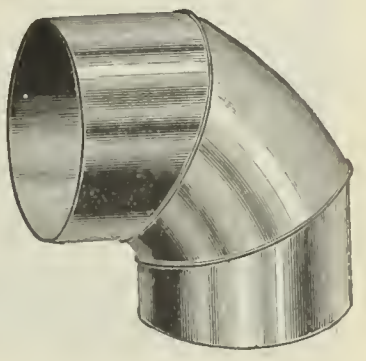
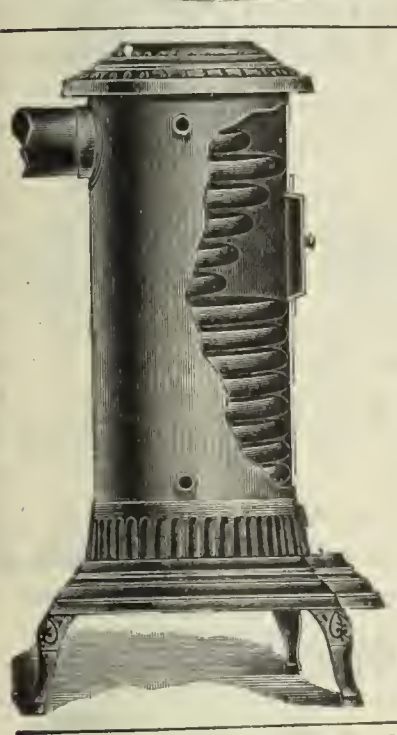


of Furnace Pipes and Fittings.



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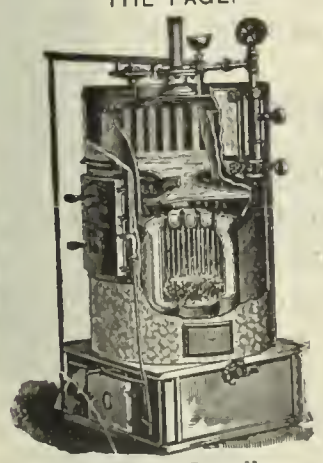

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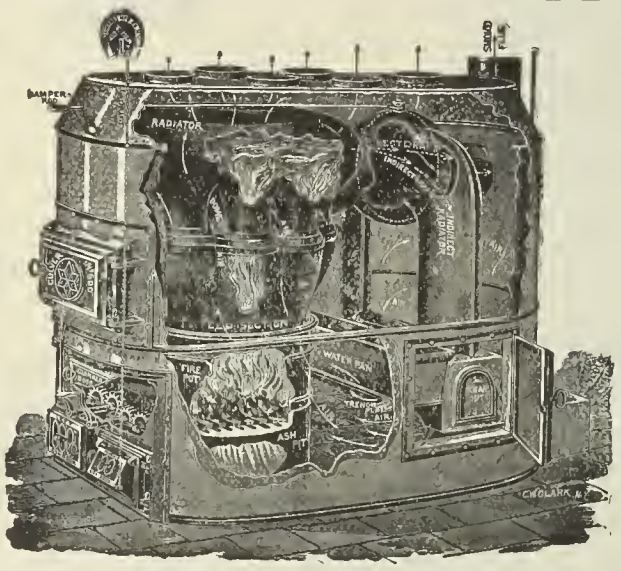

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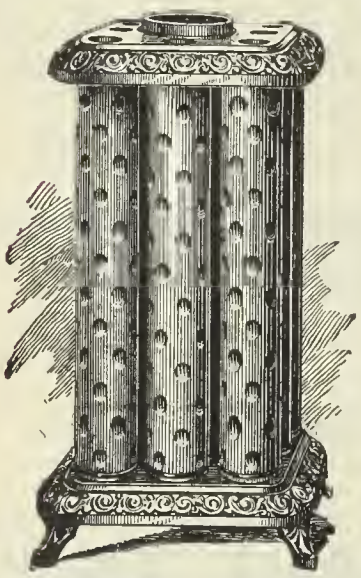

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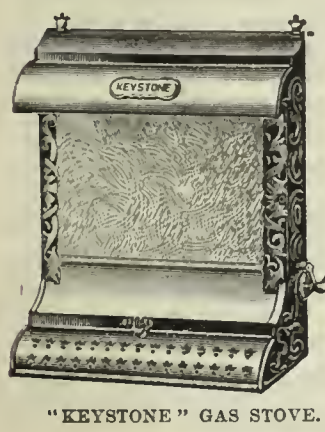

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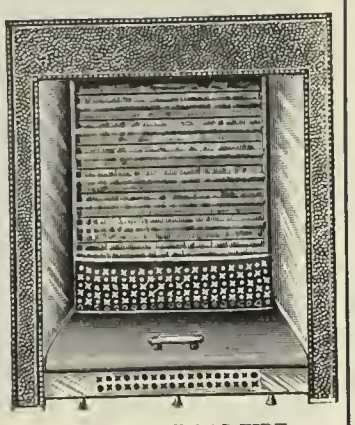

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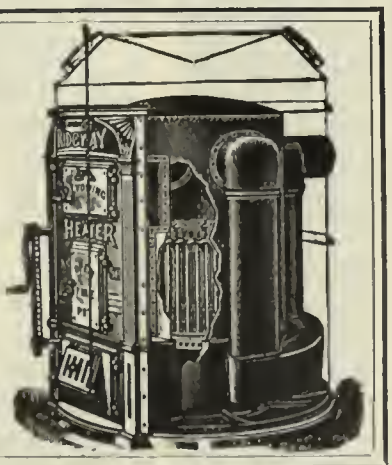

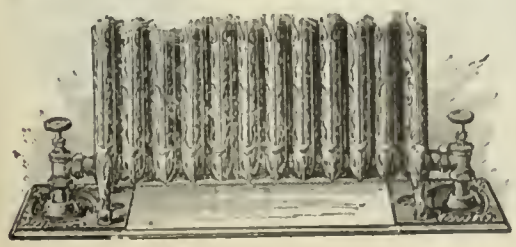

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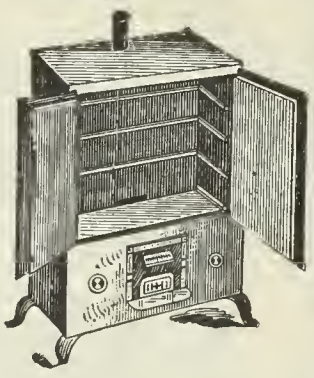

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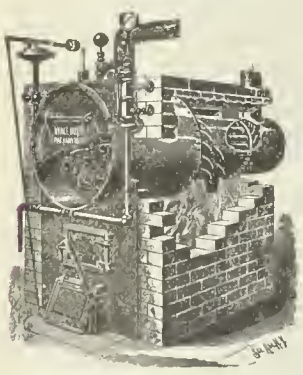

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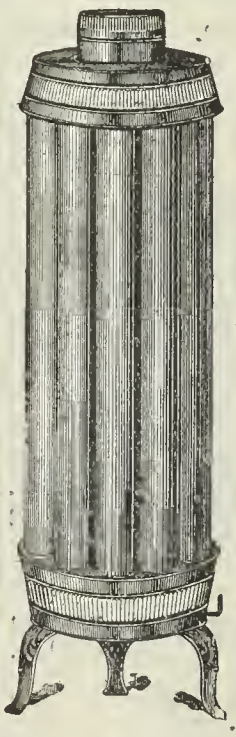

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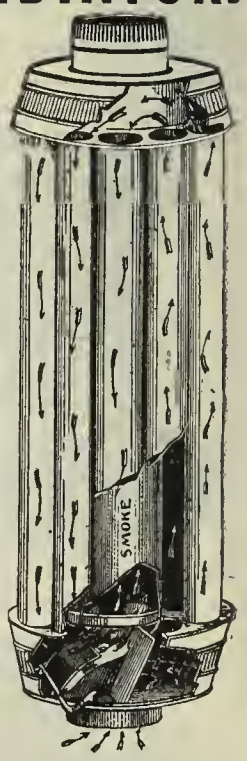

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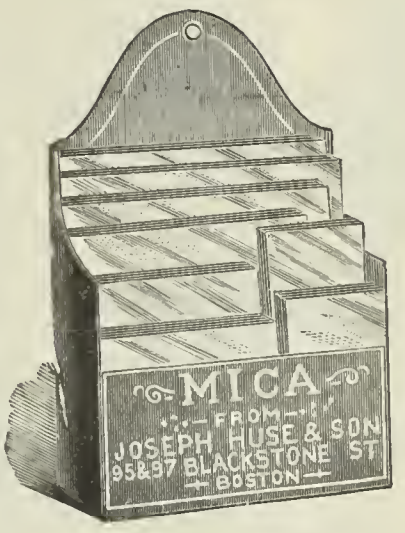

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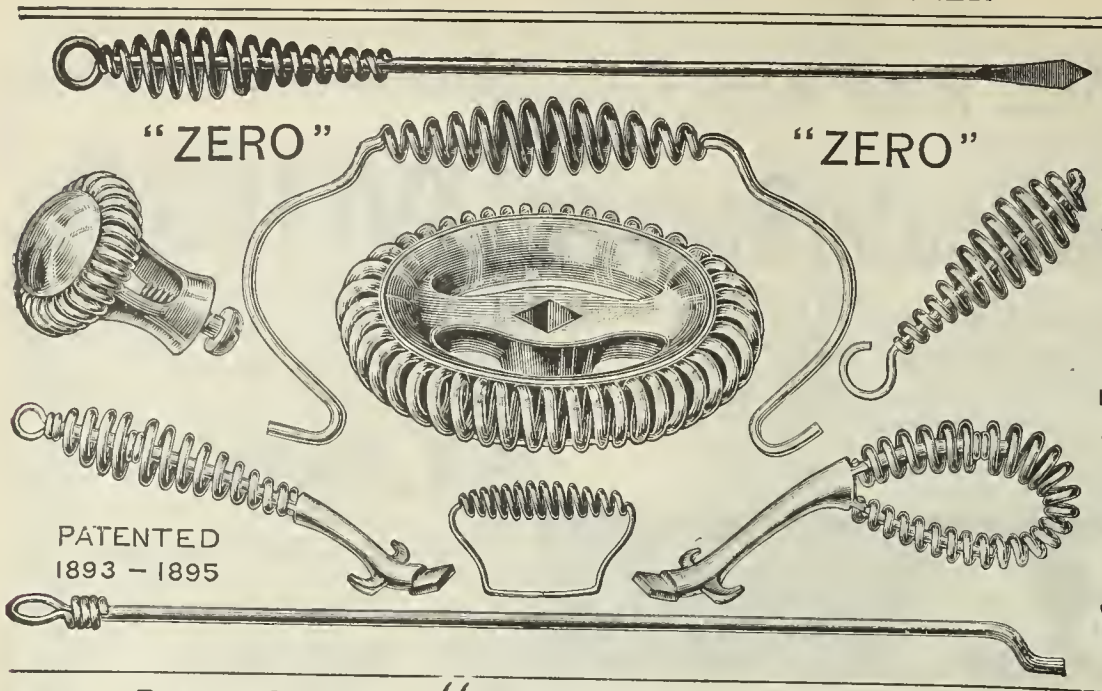

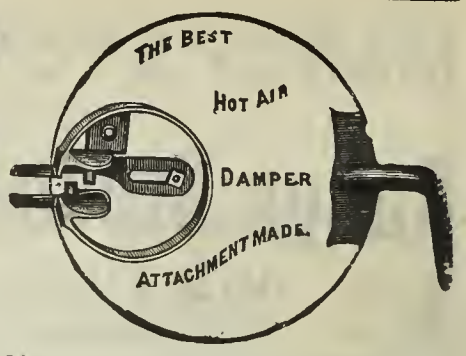

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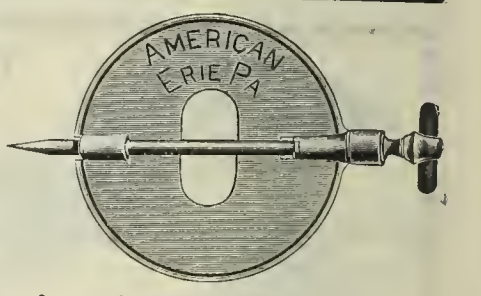

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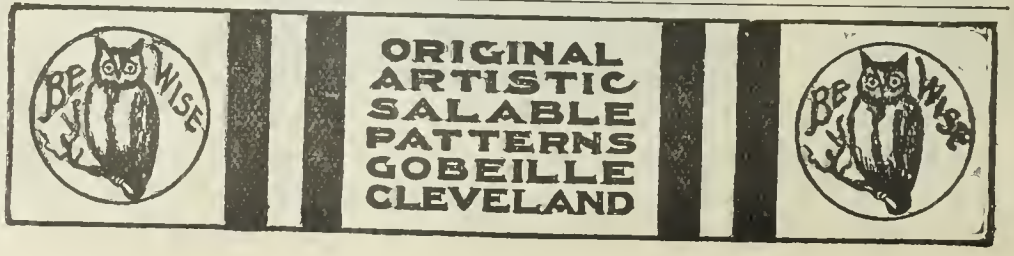

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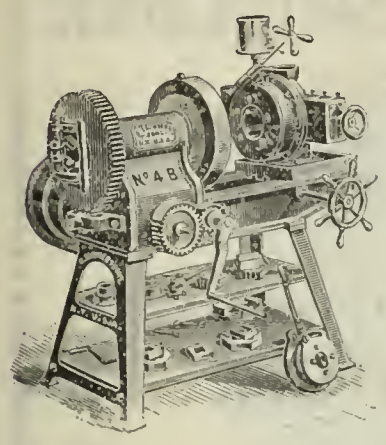

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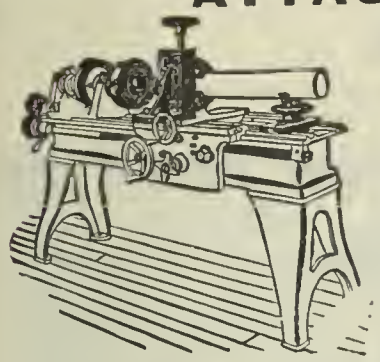

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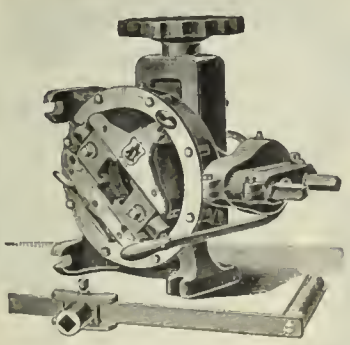

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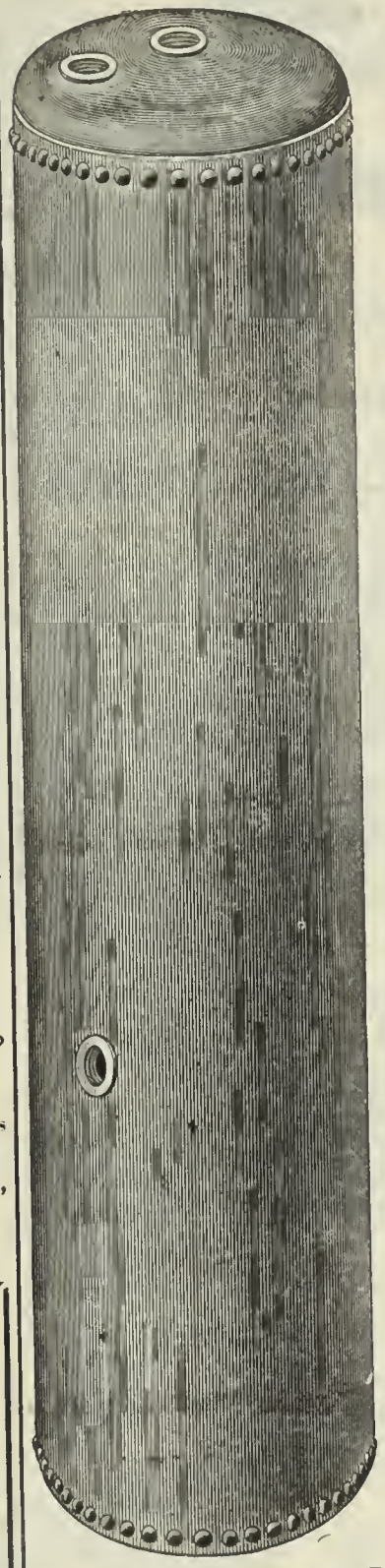

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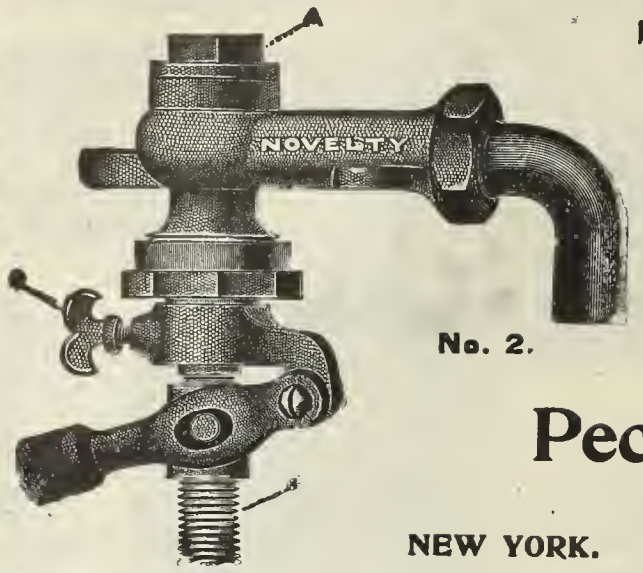

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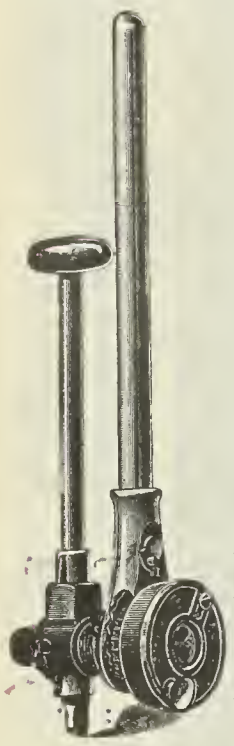

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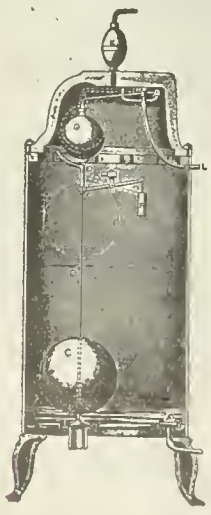

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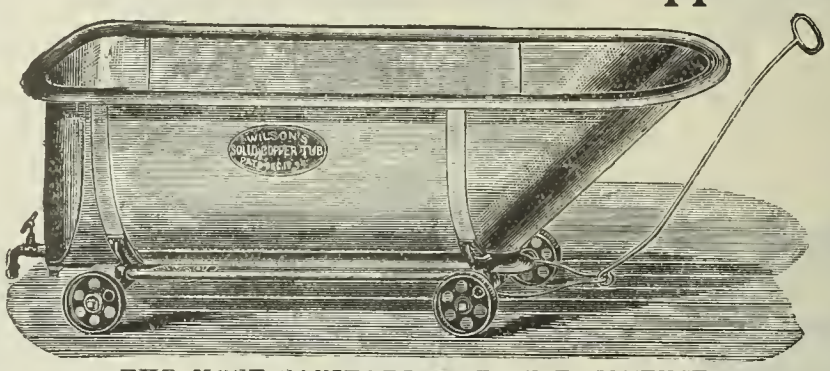

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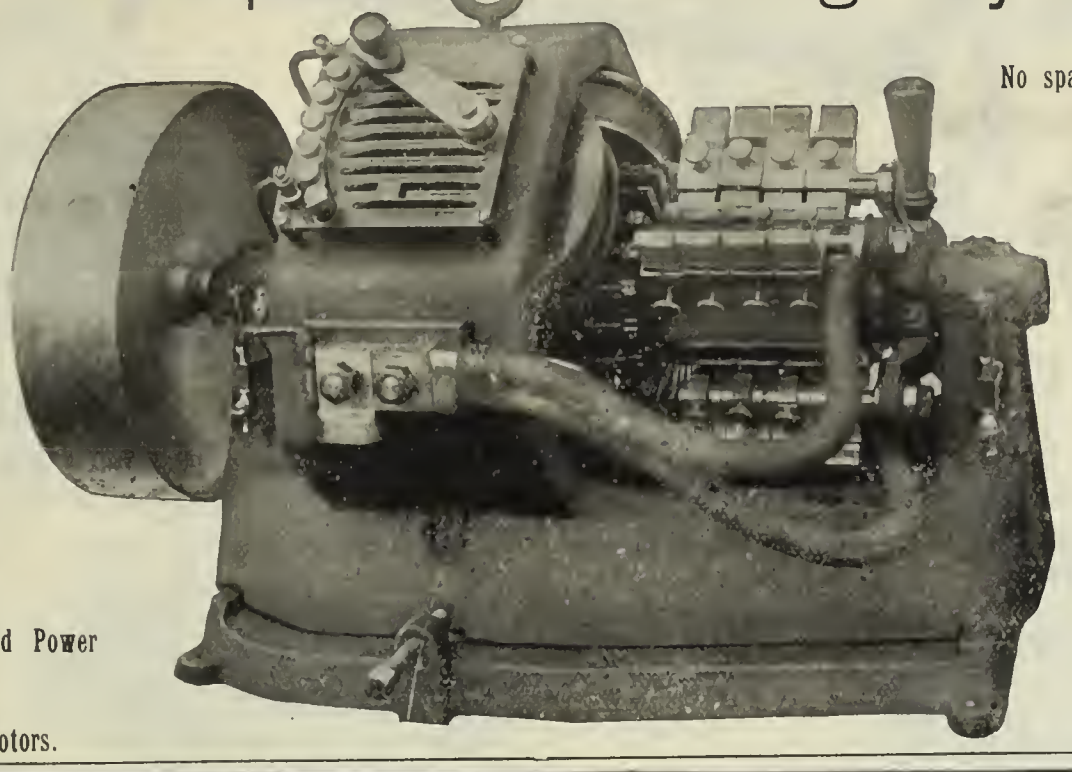

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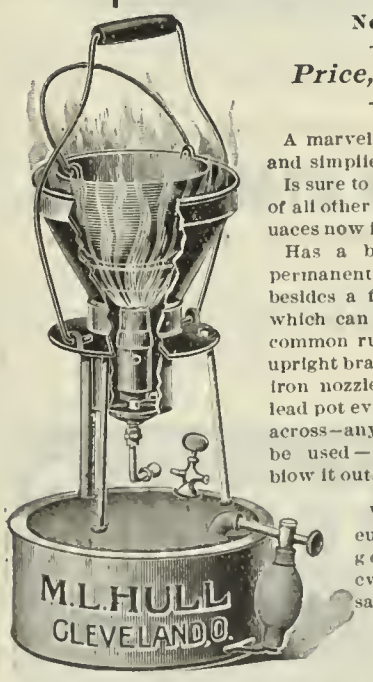
No 8.

Price, $6.00.



A marvel of efficiency and simplicity.

Is sure to take the place of all other plumbers' furnaces now in use.

Has a better tank—a permanently fixed pump, besides a filler screw to which can be attached a common rubber bulb—an upright brass burner with iron nozzle—the nicest lead pot ever shown, 6 in. across—any lead pot can be used—no wind can blow it out.

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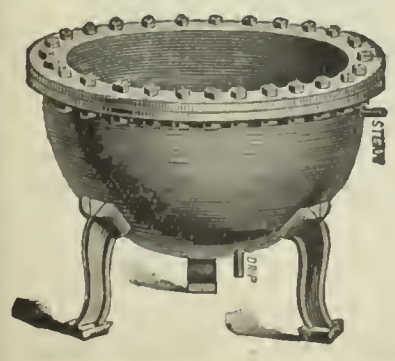

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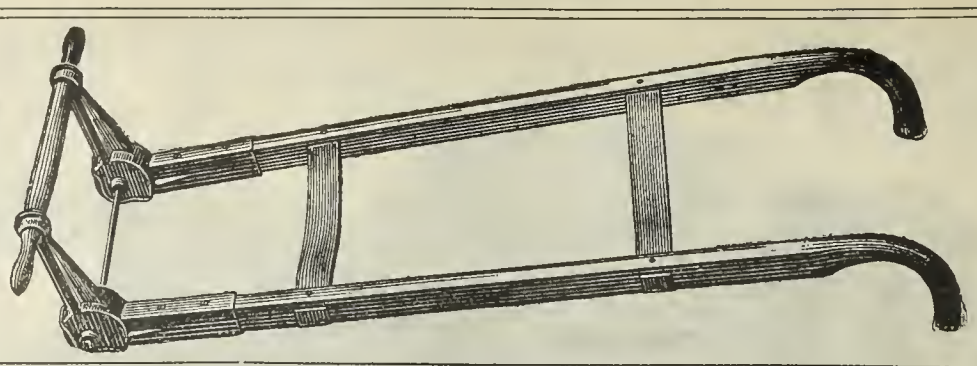

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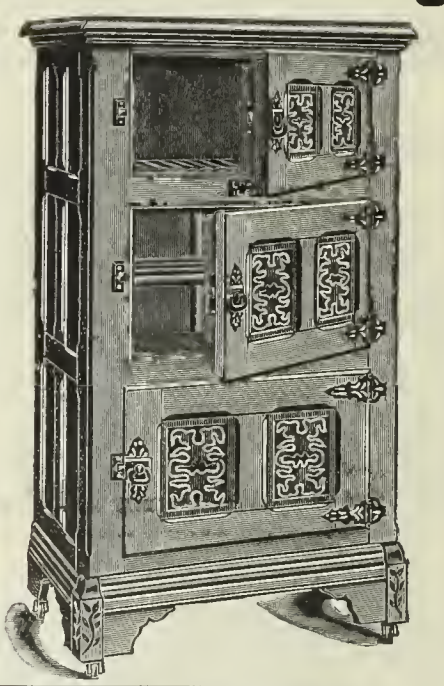

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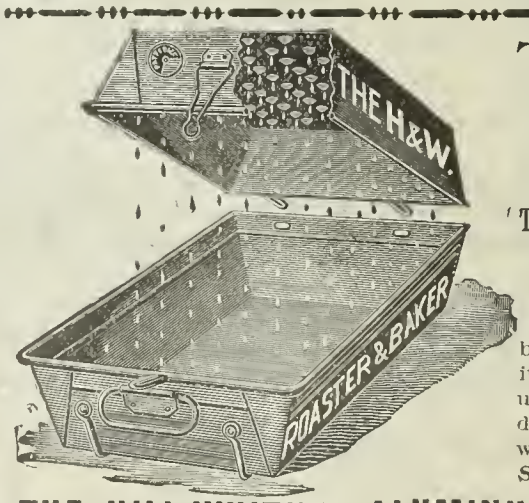
The Only Perfect Self-Basting Baking and Roasting Pans.

The Latest improved and Most Perfect Pan in Use. Made of Planished Steel.



The Self-Basting "H. & W." also combines *all* the advantages of other pans; its simplicity of construction enables the user to adjust and handle it readily; very durable and easily cleaned. The *only* Pan with *Indentations in the Top, making Self-Basting Positive.* See cut.

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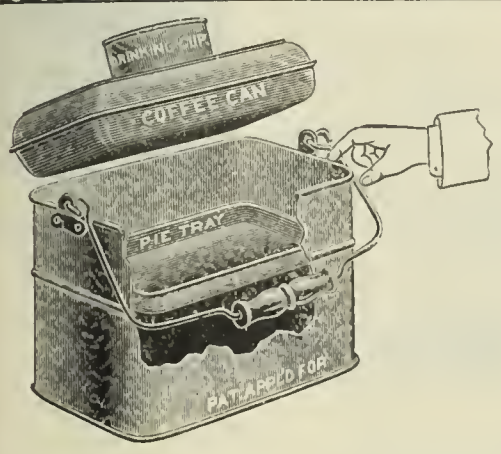

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We are making in Granite Steel.

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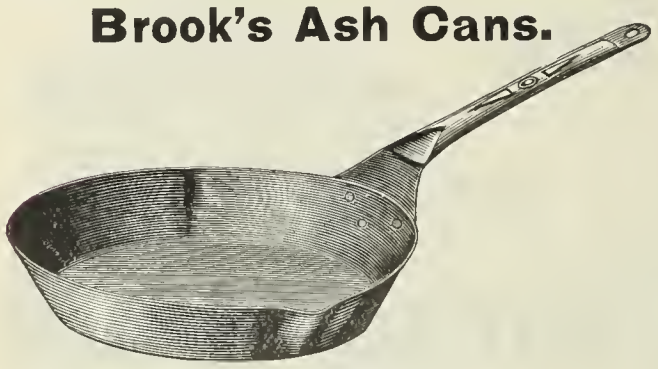

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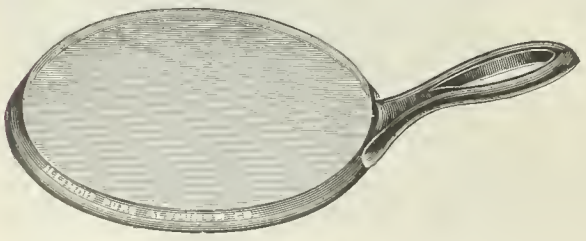

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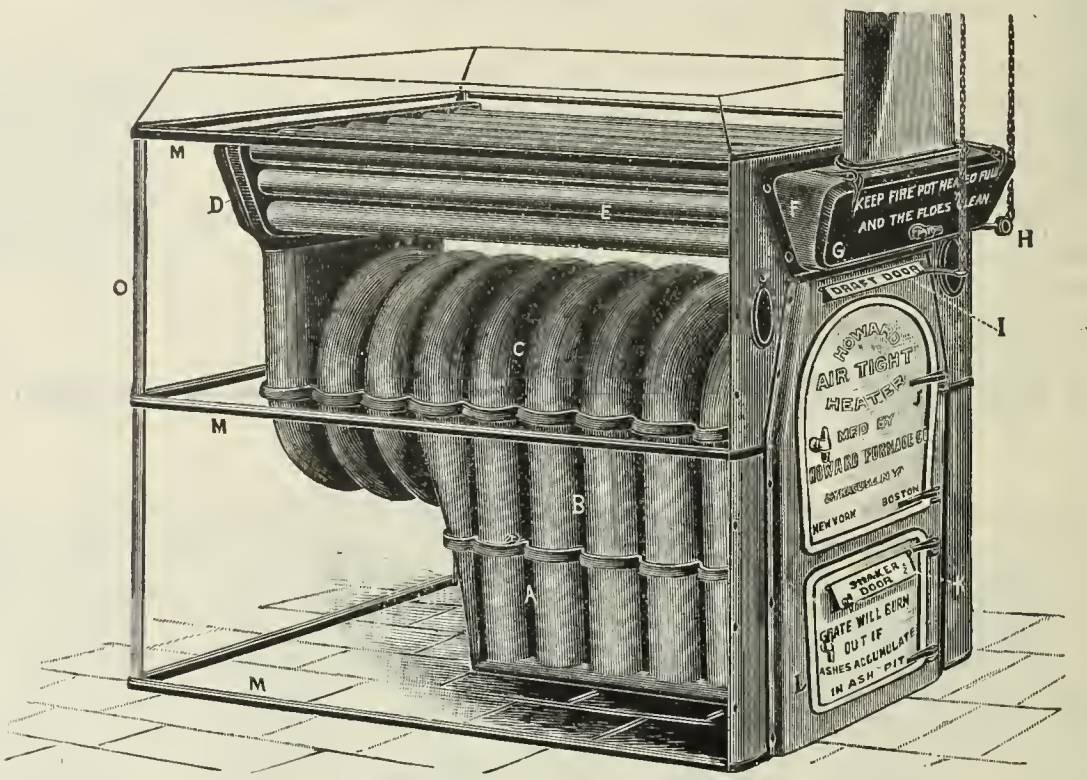
are not conducive to the perfect burning of fuel. They may be regarded as of obsolete construction when the science of combustion is to be treated with any degree of certainty. They allow the unburned particles of carbonaceous matter to pass up and away from the fire to a point beyond where the temperature is insufficient to induce a chemical change between the combustible and the supporter of combustion. That means a waste of heat. It also means a waste of iron. It's paying for something not needed.



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furnaces to heat. We can give any dealer a varied line of heaters to suit the taste of the most fastidious customers. Our best furnaces have low combustion chambers. They are made that way for a dozen good reasons. Perfect combustion due to the close confinement of the gases to the fire is one of them. If you are further interested let us know.

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NEW YORK AND CHICAGO.

Saturday, December 11, 1897.

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Index to Reading Matter.....Page 57.

The Business Situation.

A diminishing volume of trade is among the normal characteristics of the closing weeks of the year. This is a waiting season in many industries, and among merchants a time of preparation for the balancing of books in anticipation of the annual inventory. These influences, while clearly reflected at the present time, do not seem to be so pronounced in their effects on the general business of the country as is usually the case so late in the year. Trade reports from all quarters indicate a comparatively active movement of merchandise to be still going on, and the retail trade, especially in winter and holiday goods, is probably larger than it has been at this season for many years past. This activity was reflected in last week's record of bank clearings, which reached the remarkably large total of $1,325,000,000, 16 per cent. more than the total of the previous week (in which there was a holiday), and 15 per cent. more than in the same week of 1896, equal to or larger than in any other week of the past two months. Prices in general are firm, with no noteworthy declines or advances in any line. The principal event of the week bearing on the financial situation was the meeting of Congress on Monday and the issuance of the Presidential message. The effect of the message upon Wall street had been largely discounted by the forecasts which were published, consequently it produced no sensational results in the speculative markets. At the same time it exerted a favorable influence in strengthening values and stimulating business in the Stock Exchange. In the opinion of the most thoughtful and influential men in the street the message is regarded as a conservative and judicious document, calculated to advance the best interests of the country, and consequently favorable to financial and commercial prosperity. The fact of Congress being in session is always, to some extent, an unsettling factor in the business situation. But it is not generally believed that any radical measures are likely to get through the present Congress, and the course of American securities is expected to be toward improvement in market values rather than in the reverse direction. Money is still very easy, and loaning rates have been somewhat reduced. Wheat prices advanced two and one-half cents a bushel within the past few days, on the strength of heavy exports and diminishing receipts, while corn and cotton are firmer and fractionally higher. Collections are generally reported as satisfactory.

The Generosity of Millionaires.

It is a too common fashion in these days to denounce the accumulation of great wealth. Millionaires are sometimes spoken of as if they composed a kind of criminal class. Their riches are held forth—in most cases without a shadow of justice—as circumstantial evidence of their knavery. The mere fact of a man being the possessor of a large fortune stamps him in the minds of some unthinking and prejudiced individuals as a public enemy whose interests are diametrically opposed to those of the people at large. No matter how honestly and with what patient toil he may have amassed his wealth, there is a lurking feeling that he has selfishly grasped a much larger share of this world's goods than should rightfully belong to any one man. No doubt there are too many cases in which large wealth has been accumulated by means which, to say the least of them, do not measure up to the standard of the Golden Rule. There are, and have been, millionaires who fully deserved the popular disesteem in which they are held. Some who have made their money honorably have hoarded it selfishly and transmitted it for the aggrandizement of their families, applying none of it to the public welfare. But we venture to say that these unworthy specimens are the exception and not the rule among American men of wealth. In no other country in the world does the sense of stewardship appear so pronounced among the wealthy as in this. Colleges, educational institutions, libraries, observatories, hospitals, museums, art galleries, churches, charitable institutions of all kinds, by the hundred and the thousand, all over the land, stand as mute but eloquent witnesses to the generosity and public spirit of the men of wealth who have founded, endowed or munificently assisted them. Science, art and learning have been fostered and promoted by the much maligned millionaires to an extent utterly unthought of in former generations. Every year sees public gifts for philanthropic and educational purposes poured out on a scale of increasing liberality, showing that the possession of riches does not necessarily or even generally deaden the moral sense or the finer feelings of their possessors.

The Renewed Demand for Iron.

The fight for iron is not ended. A gallant struggle is being maintained by men who insist that steel is not nearly so well suited to their purposes as iron. Readers of our market reports have not failed to observe that for some weeks the demand for bar iron in the West has been running much above that for bar steel. This may be attributed partly to the lower price now being made on bar iron in that section. But it must be admitted that among certain classes of consumers a strong preference still exists for iron. Some

important manufacturers of farm machinery are finding that the change made from iron to steel in their machines in the past two or three years is bearing troublesome fruit. Their customers complain that repairs are not so easily made as when iron was used. The ordinary blacksmith finds it sometimes difficult to make a weld or to cut a thread or to tap for a bolt, and tells his farmer friend that steel is not suited for such purposes. Another call for iron has therefore been recently going out from this class of trade, much to the gratification of those who are better prepared for making it than finished steel.

But it is not in bar iron alone that a lingering demand is seen for the more tractable metal. Curious instances are cropping out of preferences for iron in other branches. Recently an order was entered for iron sheets for roofing, which the buyer said he proposed to run through corrugating rolls himself, so as to be absolutely certain that he was not having steel substituted in the painting room. His claim was that a steel sheet rusted so much more rapidly than an iron sheet that he could not afford to put on a steel roof, as it would need repairing too quickly. Enginecrs on some important railroad systems are found adhering rigidly to iron in their bridge specifications, notwithstanding the general use of steel in all kinds of structures, because they deem it the more reliable metal. They fear the effect of cracks from punching or internal strains from rolling, and refuse to be guided by the practice of their professional brethren who lay down rigid specifications for the steel maker and have sufficient confidence in their own formulæ to use the product thus turned out. Then there are nail consumers who look back regretfully to the days when iron cut nails were the only nails to be had. They claim that rust did not so quickly affect them as it does the modern steel nail. Instances in other lines might be adduced to show how much finished iron is still sought after by those who claim practical knowledge of its merits. This preference goes so far, in fact, that some iron workers will not be satisfied with anything but Swedish charcoal iron, especially when making difficult or intricate forgings.

While it would be absurd to argue from these facts that the great change to steel has been seriously checked, hope for the future is nevertheless held out to those who have continued to manufacture finished iron. A market still exists for a reasonable iron output and will continue to exist unless the difference in price is so great that it eclipses all other considerations. Consumers are discriminating, and names no longer cut an important figure with them. At one time the word "steel" was a name to conjure with, and the manufacturer who made a steel mower or reaper or cultivator or other steel article carried the day against a competitor who had not come to the point of discarding plebeian iron. But now the steel used must in all respects be suited to its purpose or it is not considered as good as iron.—*The Iron Age.*

The Trans-Mississippi Exposition.

Active steps are being taken to secure an important display of exhibits for the Trans-Mississippi and International Exposition, which will be opened at Omaha, Neb., in June, 1898. The United States Government is pledged to take part in the enterprise by the erection of suitable buildings and an exhibit. For this purpose $200,000 has been appropriated. By direction of President McKinley, the Secretary of State has extended official invitations to foreign nations to take part in the exposition. The Government exhibit will be one of the most comprehensive ever made, as it will comprise those given at the great fairs held at Chicago, San Francisco, Atlanta and Nashville. All the Trans-Mississippi States are to make exhibits, and a number of South and Central American countries, including Chili, Peru, Brazil, the Argentine Republic, and also Mexico, have signified their intention to take part in the exposition. The exposition has $2,000,000 capital to start, and 300 acres are now being laid out for exposition grounds. Offices are about to be opened in New York City for the purpose of securing exhibits from the Eastern cities, under the charge of Clinton Felder of the Department of Exhibits. A number of large concerns in New York have already engaged space, and Mr. Felder expects to secure a very satisfactory representation of Eastern manufactures. The New York City offices will be kept open for five months.

A Factor in Success.

A correspondent who recognizes the value of modern methods of bookkeeping and the advantages of an accurate knowledge of costs sends to us the following interesting and suggestive communication:

An up-to-date bookkeeping system, which will show each month the progress of the business and will provide the cost of each article made, is an essential part of the plant of the modern manufacturer. The firm or company who are satisfied, the year through, with the bookkeeper's assurance that the "ledger is in balance," and are content to wait until some weeks after the annual inventory has been taken for the first intimation of how the business has been going on for a year, are not in the lead to day. Manufacturing businesses are so dissimilar, and the requirements of each are so varied, that a formula adaptable to all alike is unattainable. Each business must be studied by the accountant, its individual needs catered to, suitable books of account and record inaugurated, and simple forms of daily, weekly or monthly reports to the head of the house designed. The saving in time and labor during the first year, resulting from the adoption of such methods, will more than cover the cost of new books and accountant's services, while the benefit of the improved facilities will be felt from the start.

The Paris Exposition.

The report of Major Moses P. Handy, special commissioner to the Paris International Exposition of 1900, was submitted to Congress by the President on Tuesday. In his letter transmtiting the report the President made the following observations:

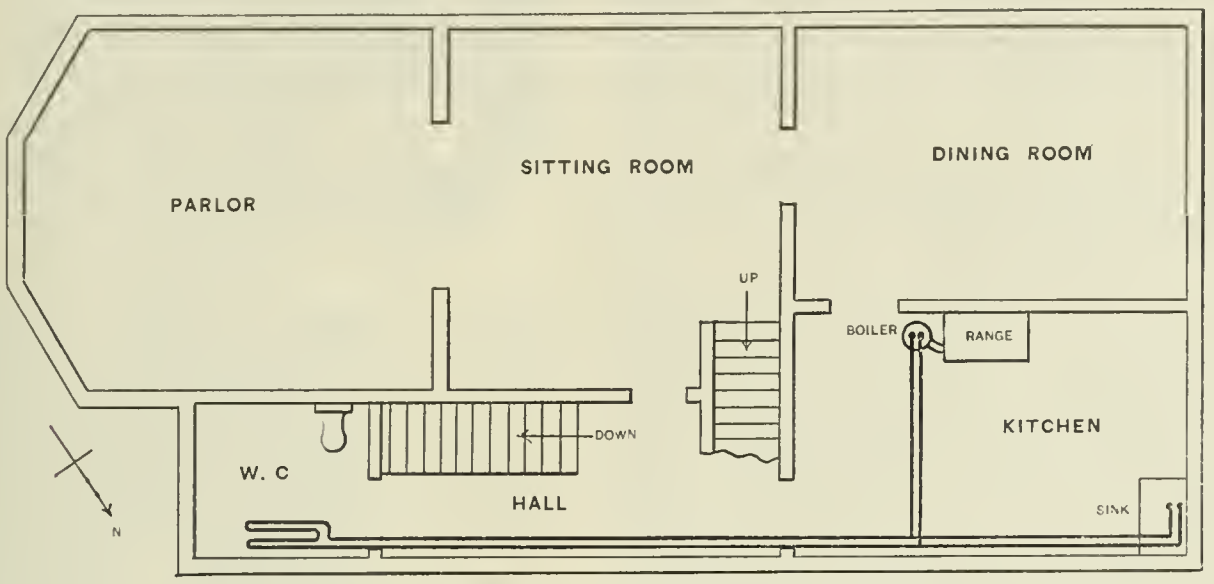
Besides securing a much larger amount of space than had been reserved, Major Handy obtained the gratifying assurance that the United States will be placed on a footing with the most favored nations, and that in the installation of every important department the United States will have a location commensurate with the dignity and importance of the country, and adjoining in every case countries of the first rank. In view of the magnitude and importance of the approaching exposition, and of our standing among the nations that will there be represented, and in view also of our increased population and acknowledged progress in arts, science and manufactures, I earnestly commend the report of Major Handy to your consideration, and trust that a liberal appropriation may be made.

Commissioner Handy embodies in his report a recommendation that an appropriation of $919,600 be granted by Congress, so that a creditable display may be made on the part of the United States. He believes that this country will secure about 200,000 square feet of space. Already, two years in advance of the exposition, he has received applications by intending exhibitors for 132,969 feet, or more space than was ever occupied by the United States in any foreign exhibition. The commissioner strongly recommends that every proposed exhibit be submitted to a critical inspection by the United States Commissioners in order to keep out the commonplace, in view of the great preparations that are being made by European nations to excel in the quality rather than in the quantity of their exhibits.

THE LETTER BOX.

Heating from Range Boiler.

From C. S. M., Utica, N. Y.—I wonld like to have a little assistance from *The Metal Worker* on a heating job which I have in hand. Fig. 1 presents a plan view of the second floor, showing the location of the range, the boiler and a room at the front of the building in which a water closet is placed, which we wish to keep from freezing. This room contains about 425 cubic feet of space and is over the first-floor hall. The building is of frame construction. Fig. 2 is an elevation showing how we propose to rnn the piping and locate the radiator. We would like to know if this plan of piping is correct and what size of pipe and radiator should be used to secure satisfactory results. A hall leads into the closet room, which must also be taken into account in the heating.



Heating from Range Boiler.—Fig. 1.—Plan, Showing Work to be Done.

Answer.—The success in heating, if the job is properly piped, depends on the ability of the water back in the range to heat the extra amount of water that will be required for warming the room in qnestion. If the fire is not rnn continuously there may be some difficulty in heating a 30-gallon boiler and the radiator in addition. From the sketches furnished we assume that the radiator is to be located in the form of a heating coil on the ceiling of the room to be heated. Better service would be secured if the heating coil could be located on the side wall near the floor on the outer wall of the building. For the space to be heated a radiator presenting 15 square feet of surface would be sufficient. To secure proper circulation the connection at the top of the boiler should be taken out and a 1-inch pipe run direct to the radiator, a tee being placed at the top of the vertical pipe immediately above the boiler, to which the service pipe to the sink should be connected. The return from the radiator should be 1 inch in size all the way to the water back, and the pipe bringing the cold water from boiler to the water back should connect into this 1-inch pipe. If this return pipe from the radiator can be run along the floor so that it will not be in the way until it reaches the kitchen it might drop down and run nnderneath the floor to a point just beneath the water back, when it could rise through the floor and be connected. The plan presented will probably prevent the closet from freezing, but more effective heating would be secured by placing the heating coil as we have suggested.

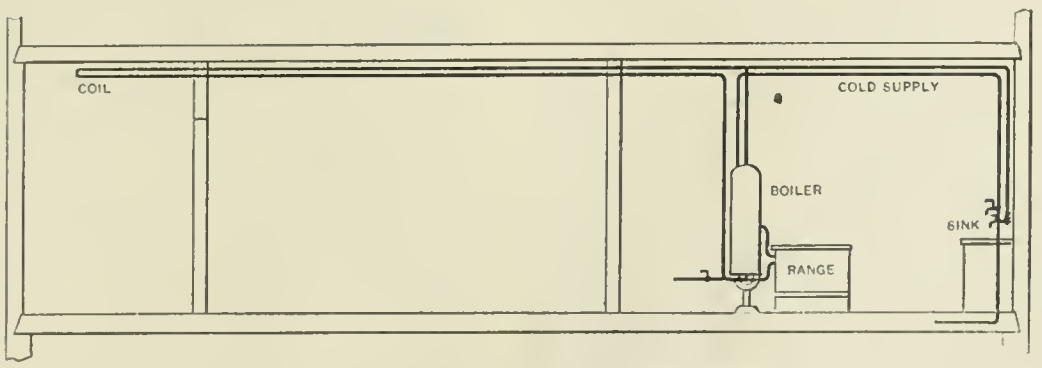


Fig. 2.—Elevation, Showing Proposed System.

Trouble With Solder in a Copper Tank.

From W. C. B., Ridgewood, N. J.—The inquiry of "F. F. H.," Woodbury, Conn., in *The Metal Worker* of November 27 in regard to the trouble with solder, touches a subject in which we are very much interested. In Ridgewood, N. J., where there is no public water supply, the water is obtained in most cases from bored wells which are drilled from 100 to 300 feet deep. The water thus obtained is what is usually termed "hard," and contains a great amount of magnesia, lime and other substances, which either eat or decompose the solder used, or else it is the mineral quality of the water that creates a galvanic action when the solder is used on copper, and which gradually destroys the solder. Apparently it has

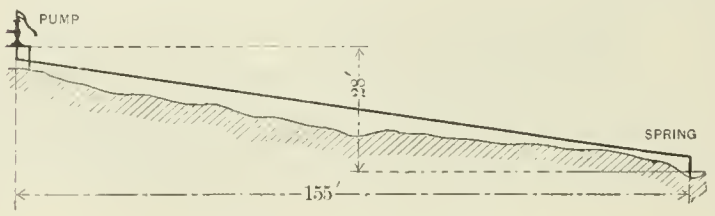
the same effect as the action of sal ammoniac on zinc in the ordinary wet batteries. We have had to resolder at least a dozen tanks in which the solder was entirely eaten out. The lines of the soldered seams show a white chalky substance on the surface and black underneath, which resembles carbon, and when rubbed or scraped turns the water like ink. The copper and solder dealers have been consulted, and they do not know the cause, nor have they been able to suggest a remedy. We have experimented a little and found that paraffine and beeswax, or the proper proportions of wax and resin, will, in some cases, prevent the water from reaching the solder, and thus preserve it. We would also like to hear from other plumbers who have had the same trouble to contend with, and hope that some solder dealers or chemists who are interested in this work will come to Ridgewood and examine a few hundred tanks which I know would furnish an interesting field for experiment.

From J. B., Fort Wayne, Ind.—In answer to the inquiry of "F. F. H.," in *The Metal Worker* of November 27, I would say that I think he ought to do the repairs to the tanks he mentions at his own expense, for having soldered them with half-and-half solder and having used acid for a flux on copper. The fact is that half-and-half solder is anything that the manufacturers may put into it, and worse yet if old metals are used. There is no one who uses that grade of solder because it is good, but because it is cheaper in price.

Note.—The best advice when it comes to a person in trouble always seems more or less severe, and the comment of this correspondent points to a method that would probably avoid trouble. On the other hand, many workmen who use solder have not become acquainted with the various qualities of solder which bear the same name, and assume that what they buy is exactly what it is marked, and under some conditions the materials used bring trouble. Every good tinner knows that when the surface of the copper is thoroughly cleaned it is not necessary to use acid as a flux. He also knows that the purer the metals are of which the solder is composed and the larger the proportion of tin the better its lasting qualities.

Changing Pump Arrangement.

From L. A. S., Warren, R. I.—Please inform me what sized pipes you would use and how many valves, and where you would place them, to bring water easily



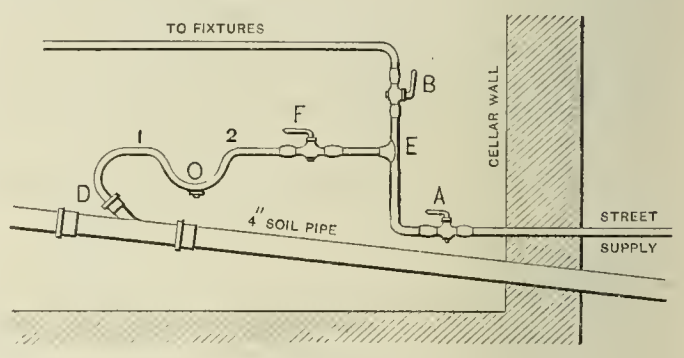
Changing Pump Arrangement.

from the spring, according to the arrangement shown in the accompanying diagram. The hight of the pump is about 28 feet above the spring, and the length of the piping 155 feet, the pump being a No. 3 Douglass force pump.

Answer.—The hight of the pump, as stated, is very near the limit of reliability, and we advise the use of the style of pump with the valve chamber set 5 or 6 feet below the pump base. This can be readily done by sinking a pit and bringing the suction in at as great a distance below the pump as can be done. This will give, if 6 feet depth can be made, a lift of only 22 feet, which will give the pump a good working capacity for the long suction pipe. Use 1½-inch pipe for the suction, with a foot valve and strainer at the spring. Put a rising pipe in the pit, connected to the suction close to the pump chamber, and extending up to a convenient place for charging the suction pipe with water to start with, and close the top air tight with a cap. This answers the double purpose of an air chamber and charging pipe. See a similar arrangement illustrated and described in *The Metal Worker* October 16.

Is It Dangerous?

From O. & P., New York.—We submit herewith a drawing of a portion of a system of plumbing. The specifications call for this system to be emptied through the main supply at or near the entrance of the same in the cellar. Would it be proper to make the connection as shown in the cut, putting a stop cock at A, B and F, and at E connecting a branch with the soil pipe at D, using a common running trap O? Should this trap be vented, and if so, where—at 1 or at 2? The main supply pipe is ¾-inch pipe. The pipe from E to D is also ¾-inch lead pipe, with a trap made as shown. To let the water off the system it is designed that the cock A shall be closed



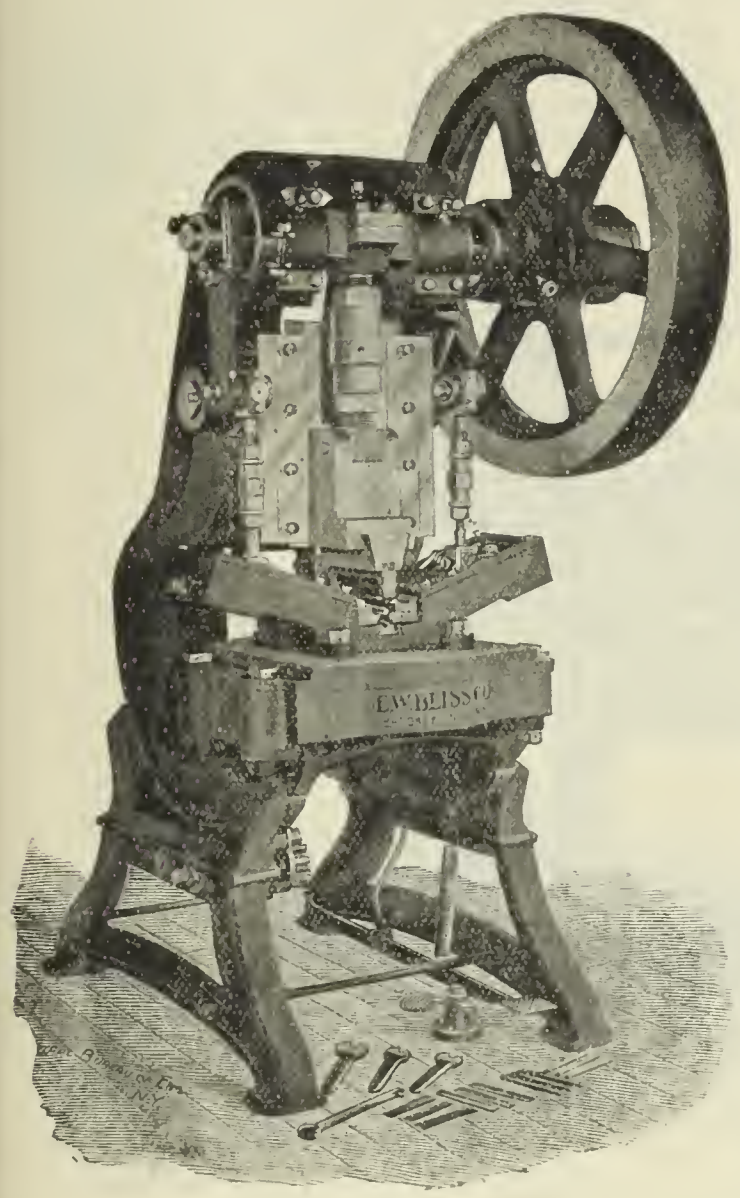
Is It Dangerous?

and the cock F opened. If the drain needs flushing, by closing the cock B and opening F and A the water will rush in and flush the drain. Kindly explain the purpose of a vent to a trap; is it to allow a column of air to enter, as at 1 in the sketch, to break the column of water in the trap and prevent siphoning out? If the vent is to be connected at 2 explain why it would vent any more than the waste pipe to a fixture?

Note.—This raises a question that can be discussed to advantage to the trade, and we hope that those who have had experience with similar connections and observed the results will present their views. It is considered by some that it would be safer to avoid such a connection. The possibilities of danger to the health of the occupants of the building arise when the water has been drained out of the service pipes and the pipes left empty for a time when there would be no hindrance to the entrance of sewer air to the house, unless the trap seal had not become broken by evaporation, or that the stop cock at F had been closed after the system was drained. With the stop cock F closed there is no possibility of sewer gas entering the water service of a building. When the building is occupied and the system in use under ordinary circumstances there would be no objection to the connection. When it is desired to flush the house soil pipe, the pressure of the water in the service pipe would be sufficient to prevent any possibility of sewer gas coming into the building. The rush of the water through the pipe E D would be sufficient to drive the sewer air or other matter in the opposite direction. The case in question is similar to what is common practice in New York City, where instead of putting an ordinary bib under the boiler for a sediment or draw off cock, the stop cock is placed in a pipe which runs over to the waste from the kitchen sink and is discharged into it, so that in case it is desirable to cleanse the boiler of sediment it can be readily done. This cock also serves as a means of withdrawing water from the entire plumbing system, when the building is to be unoccupied during the winter season. It must be borne in mind, however, that under exceptional circumstances there might be danger of the contents of the drain entering the water supply pipe. For example, assuming the drain to be partly choked between D and the sewer, and the cock A to be closed and the water drawn off by opening F, then if a closet was flushed on an upper floor by the water remaining in the tank, the discharge might back up into the water service pipe through D.

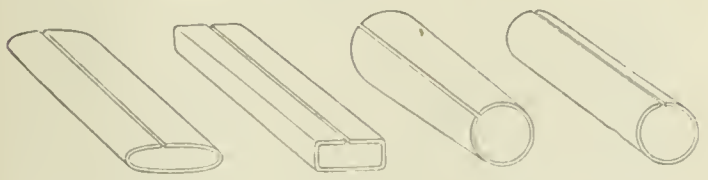
The Bliss Tube Forming Press.

The press shown in the accompanying cut illustrates a machine that will form tubes up to 10 inches in length at one blow, either straight, taper, round, oval or square, as shown in the line drawings, ¼ to 1 inch in diameter, according to the dies used in it. The operator can form 20 tubes or more per minute. The toggle slides, which operate from the right and left, are cam actuated and easily adjusted for different shapes. The mandrel over which the tubes are formed first descends upon the blank, bending it into U shape and carrying it against the lower die, whereupon the forming tools attached to the lateral slides complete the operation. The tube is carried up with the



THE BLISS TUBE FORMING PRESS

mandrel after the side tools have retired and is easily removed by the operator. In the case of tubes which have to be more than ordinarily exact a second blow is usually



Specimens of Work Done on Bliss Forming Press.

given immediately after the first without stopping the press. This causes a forming blow to be delivered by the punch upon the top of the tube while held by the mandrel in the die. This machine is adapted for the manufacture of bicycle parts, hubs, pedal centers, &c., spouts, penholders, small can bodies, either round or square, &c. The weight of the press, which is built by the E. W. Bliss Company, 16 Adams street, Brooklyn, N. Y., is 3500 pounds. The company also build a heavier press for tubes 13 inches long.

Catalogues have been issued for the 1897-1898 term by the Thomas S. Clarkson Memorial School of Technology, at Potsdam, N. Y. There is one course in mechanical and electrical engineering and another in the mechanical arts, domestic science and normal manual training. Barton Cruickshank is director. The winter term begins on January 4.

The Panama Canal.

United States Consul General Gudger, at Panama, has made a report to the State Department on the condition of the Panama Canal, of which the following is the gist: The canal when completed will extend from Colon on the Atlantic to Panama on the Pacific, 54 miles. All along the route are sheds full of new and costly machinery. It was estimated the latter has cost $100,000,000, and that there has been expended on the canal a total of $275,000,000. A conservative estimate is that the canal is about one-third finished, but with the new machinery on hand it is said the remainder of the work can be completed for $150,000,000. The report is that a force adequate to finish the project in from seven to ten years will be put to work. During the next 60 days a committee is to investigate the progress of affairs, and an effort will be made to get more money to continue operations. The canal is practically completed from Colon to Bajeo, 14 miles, but this is the least expensive part. The great difficulty is in passing the Calebria Ridge. The width of the canal will be 160 feet at the top and 72 feet at the bottom, except through the ridge, where it will be 78 feet wide at the top and 29 feet at the bottom.

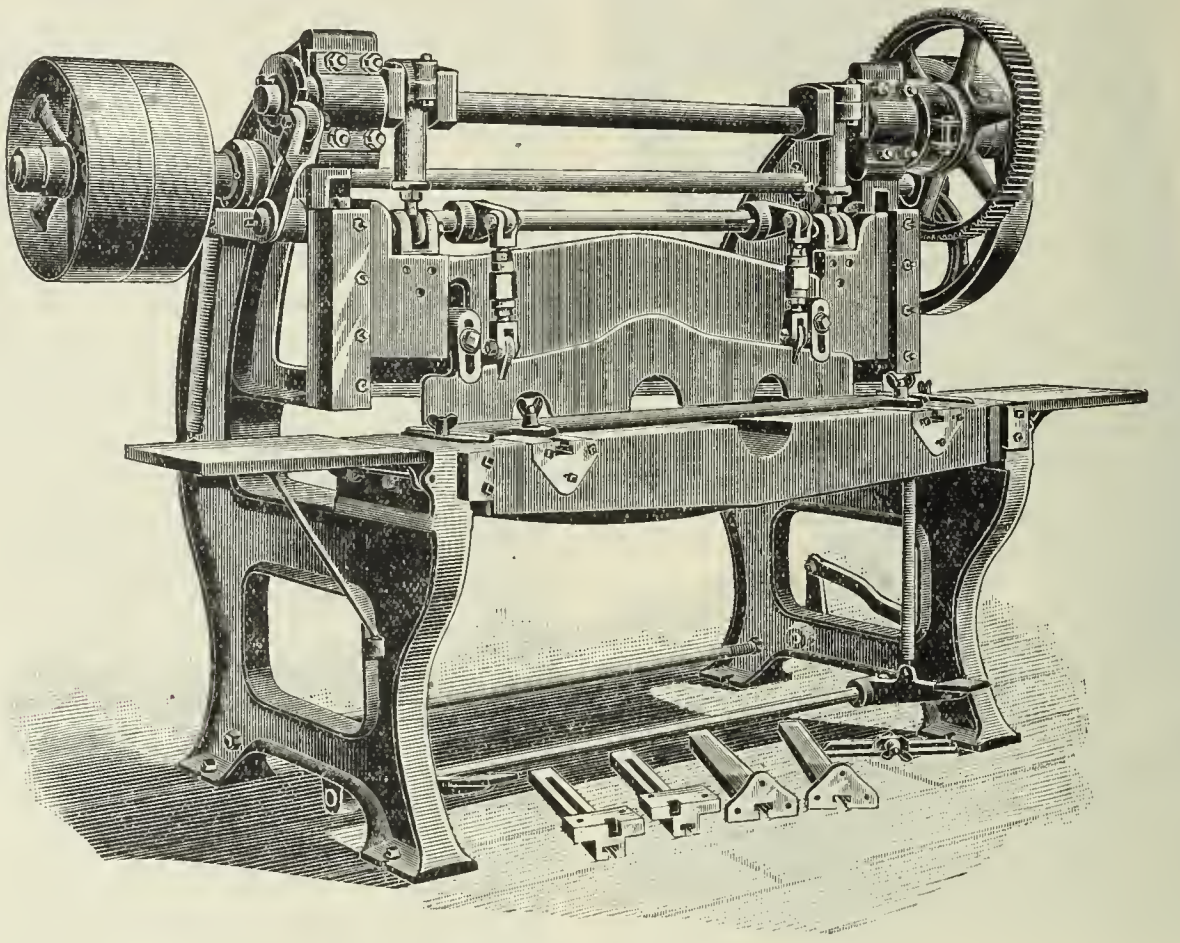
The Otto-Hoffmann Coke Ovens at Boston.—We have been furnished with some interesting facts regarding the new by-product coke plant to be erected near Boston. The works will be located at Everett, 2½ miles from Boston, adjacent to the Boston & Maine and Boston & Albany Railroads. The plant will be built by the New England Coke & Gas Company, which concern have acquired all the rights and privileges granted by the State to the Massachusetts Pipe Line Company and have also absorbed the latter concern. A site containing 250 acres of land has been secured with harbor frontage on Mystic River and Island End River. The works are planned for 1200 ovens, or three blocks of 400 each. Four hundred of these ovens are now under construction and work is being pushed as rapidly as possible. When these have been finished another block will be commenced. The Dominion Coal Company will furnish the coal from their Nova Scotia mines. The coal will be washed at the mines and will be shipped to Everett by steamer. The shipping facilities will enable the company to ship coke by lighters around the harbor and also by rail. The works will include an ammonia factory, a benzole factory, a purifying house and 10,000,000 feet of gas holder capacity. The general plan of the works is practically the plant at Glassport, Pa., but, of course, on a much larger scale. A full description of this plant appeared in *The Iron Age* of November 11. It will require fully a year before the 400 ovens now under way will be completed. The coke output from these 400 ovens will be 500,000 tons a year. The gas output will be 6,000,000 feet per day. The principal consumers of the coke will be the railroads, and a large crushing plant will be included in the equipment and will be used to crush part of the output to the proper size for domestic use. Most of the gas will be sold to the citizens of Boston for heating their houses. The balance of the gas output will be purified and sold for lighting purposes. It is the intention to furnish the gas for fuel purposes at practically the same prices charged for natural gas in Pittsburgh. The gas for light will also be furnished at a low price.—*The Iron Age.*

Exhibition in the Chicago Coliseum.—Some local capitalists about six months ago conceived the idea of having a manufacturers' carnival and winter fair under one roof, at Chicago. To this end the Coliseum was engaged for five months, and the manufacturers' carnival and winter fair will open in that building December 18, and will close May 15, 1898. Local interests, both commercial and manufacturing, will be represented by some of the largest firms, while Ohio, Indiana, Michigan, Wisconsin, Tennessee and Illinois will furnish their quota of manufactured products. There will also be the famous features of the Midway—Irish Village, Streets of Cairo, Chinese Theatre and others of the old favorites.

Wilkins and Davidson, mechanical engineers of Pittsburgh, have been appointed consulting engineers for the construction of the new sheet mill plant to be built at Scottdale, Pa., on the co-operative plan. It is stated that it will be a six-mill plant with all modern appliances. Many of the stockholders in the new enterprise were formerly employed by the Scottdale Iron & Steel Company, Limited, but went out on a strike and lost their positions.

The Niagara Power Gap Shears.

The Niagara Stamping & Tool Company of Buffalo, N. Y., are building a line of power gap shears suitable for cutting soft steel up to ⅛ inch thick. The housings have a gap or open throat 15 inches deep, which permits of trimming sheets of any length and cutting them apart up to 15 inches from the edge. The driving mechanism is put overhead instead of underneath the bed as formerly. This construction possesses the advantage that the belt will not close up the gap, particles of grit and scale, that may come off from the material while being cut, cannot drop into the working parts and the gap arms that were a necessity in the former construction have been done away with. The cross head carrying the upper knife is operated by means of a double crank shaft made of forged steel. In front of the cross head there is an automatic hold down attachment driven by means of cams and levers from the main shaft. This hold down attachment travels ahead of the cross head and holds the sheet firmly upon the bed while being cut. The motion is controlled by the Niagara clutch, which is positive and of simple construction. The illustration shows a machine that will cut and square 52 inches. Other sizes are made up to 10 feet long.



THE NIAGARA POWER GAP SHEARS

Breaking Streets to Make Connections.

The city of West Chester, Pa., has made all preparations to lay some fine streets, and is confronted with the probability that immediately after the work is completed it may have to be torn up to make gas, water and sewer repairs or connections. This has brought out in a local paper the following proposition:

To avoid such an annoying experience coming in to spoil a newly made street some plan ought to be adopted that would prevent the possibility of such an experience. This could be done by constructing an arched tunnel under each street through which the water mains and gas pipes could be safely carried, as they are done in some cities. The expense could be jointly borne by the town, which owns the water system, and the gas company. Possibly the electric light, telephone and telegraph companies might be made to string a large part of their wires through the same underground conduit, and thus allow of the removal of some of the poles which citizens occasionally complain of as disfiguring their properties. If all of these companies made use of the underground passageway they could all contribute to the expense of making it in proper proportions, whenever the Borough Council determined that it was necessary to put one in on any street. Manholes at proper intervals would allow of getting down into the tunnel for repairs and investigations. If such a plan were adopted there could be no further trouble about making a good road bed on top, and everybody would feel that it was permanent. There would be no excuse then for breaking up the surface of the street. It is possible that the cost would, when distributed among all the parties interested, be found to be even less than at present when the borough, the gas company, the telephone, telegraph and electric light companies all proceed in their own way and among them give innumerable inconveniences to the citizens when repairs are being made.

A Pocket Handkerchief Newspaper.

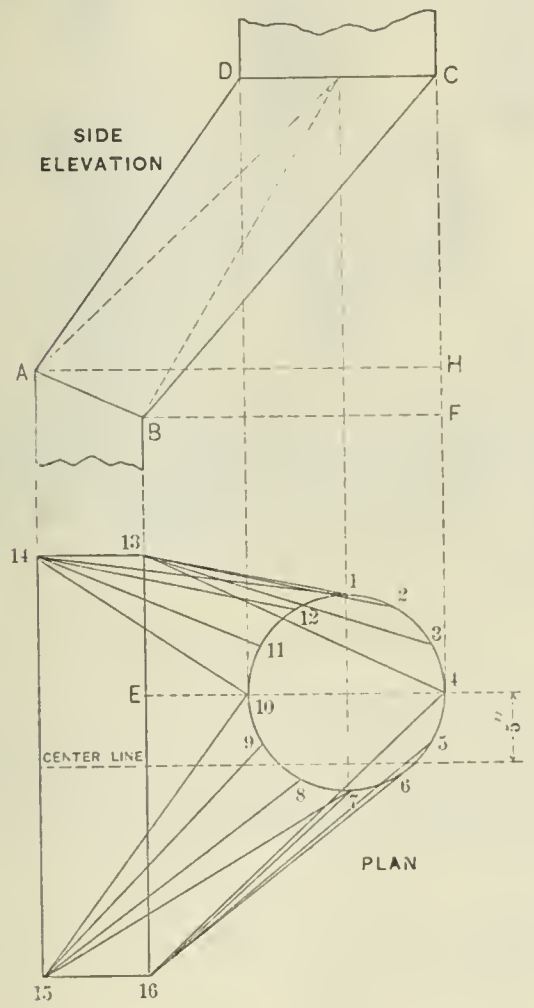
A curious relic of the old days of the paper duties which so much hampered journalistic enterprise in the first half of the present century will shortly come up for sale at a London auction room, says the *Westminster Gazette*. It is the first number of "Berthold's Political Handkerchief," being a news sheet printed on cotton fabric instead of paper, the idea being to evade the paper duty. It is dated London, Saturday, September 3, 1831, price 4 pence, and the letterpress, which is fairly legible, is as remarkable as the material on which it is printed. The tone of this news rag is intensely radical, but it reproduces the order of ceremonial to be observed at the coronation of King William IV and Queen Adelaide on the following Thursday, and it is announced that a proclamation to the people of Europe will appear in our "next cotton." It is embellished with a medallion woodcut of Napoleon crossing the Alps, but the ink in this pictorial effort was too much for the cotton, and the Alps are in a fog and the emperor on horseback very indistinct.

Plans for the establishment of a warehouse in the city of Caracas, Venezuela, by the National Association of Manufacturers of the United States, 1743 North Fourth street, Philadelphia, for the purpose of displaying samples of American manufactured articles and to serve in other ways in establishing more intimate commercial relations between Venezuela and the United States, have progressed to the point where the early opening of the warehouse has been decided upon, and those who have engaged space in the warehouse have been notified to prepare their exhibits for shipment from New York on December 14. The goods will be shipped by the Red D line, and it is expected that nearly all the exhibits thus far arranged will go forward on December 14. Some of the goods have already been shipped.

SHEET METAL WORK.

PATTERN FOR OFFSET RECTANGULAR TO ROUND.

A correspondent, "M. B.," New York City, wishes to learn through *The Metal Worker* the method of obtaining the pattern for an offset with a rectangular base and round top, with center line of round top of the front view to be 5 inches from the center line of the rectangular base, while the end view is the same as shown in *The Metal Worker* of June 5, 1897, page 36, and is reproduced herewith in Fig. 1. Let A B C D be the side elevation of the article, 13 14 15 16 the plan of the rectangular base, and 1 4 7 10 the plan of the round top. The first step is to obtain diagrams of triangles the hypotenuses of which will be used in the development of the pattern, and for



Pattern for Offset Rectangular to Round.—Fig. 1.—*Plan and Elevation.*

which proceed as follows: Divide the plan of the round top into equal spaces, as shown by the small figures from 1 to 12. From the several figures from 1 to 4 draw lines to the corner 13 of the rectangular pipe. In the same manner draw lines from the various figures 4 to 7 to the corner 16, from 7 to 10 to the corner 15, and from the figures 10 to 1 to the corner 14.

Then will these lines represent the bases of the triangles, which will be constructed as follows: It should be understood that the straight hight of that portion shown in plan by 13 16 7 4 1 is shown in elevation by F C, while the straight or vertical hight of 14 15 7 10 1 in plan is shown in elevation by H C.

Draw any vertical line in Fig. 2, as 13 A, equal in hight to C F of Fig. 1. Take the various lengths of lines shown in plan by 13 1, 13 2, &c., and place them on a line drawn at right angles to 13 A, as shown by A 1, A 2, &c., of Fig. 2. Draw lines from the points 1, 2, 3, 4 to 13. Then will these lines represent the hypotenuses of the triangles whose bases are shown by lines of similar number in plan view, Fig. 1. In the same manner construct the diagram of triangles shown in Fig. 3, whose base lines are obtained from 4 7 16 in plan, Fig. 1, and hights from F C in elevation.

Take the hight H C in elevation and place it on the vertical line 15 A of Fig. 4. Then take the various lengths

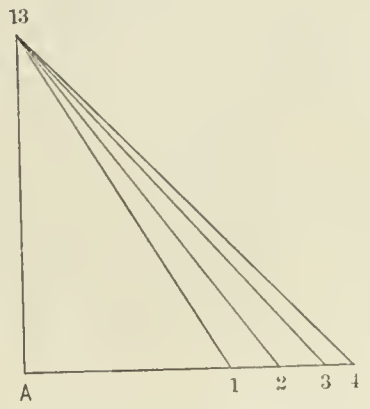


Fig. 2.—*Diagram of Triangles on Solid Lines in* 1 4 13 *of Fig.* 1.

shown in plan in Fig. 1 by 15 10, 15 9, &c., and place them on the line drawn at right angles to 15 A in Fig. 4, as shown by A 10, A 9, &c. From the points 7, 8, 9 and 10 draw lines to 15. These lines will then represent the hypotenuses of the triangles whose bases are shown by lines of similar numbers in plan, Fig. 1. In the same manner construct the diagram of triangles in Fig. 5, whose bases are shown by 14 1, 14 12, 14 11 and 14 10 of Fig. 1, and hights by H C in elevation.

For the pattern proceed as follows: At right angles to 13 16 in plan, Fig. 1, and from the point 4, draw 4 E, as shown. Then will B C in elevation be the true section on the line 4 E in plan. In Fig. 6 draw any vertical line,

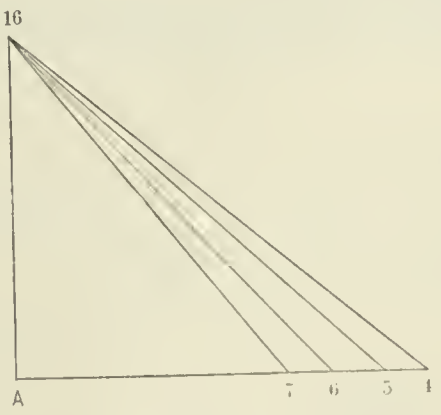


Fig. 3.—*Diagram of Triangles on Solid Lines in* 4 7 16 *of Fig.* 1.

as 4 E, equal in length to B C in elevation, Fig. 1. At right angles to 4 E in Fig. 6, and through the point E, draw the line 13 16, making E 13 and E 16 equal to E 13 and E 16 of Fig. 1. Draw a line, 13 4 and 16 4 in Fig. 6, which should equal in length the distance 13 4 and 16 4 in Figs. 2 and 3, respectively. Now with 13 of Fig. 6 as center, and the various hypotenuses in Fig. 2 as radii, describe arcs as shown by 3, 2 and 1 in Fig. 6. Then set the dividers equal to the divisions on the circle in Fig. 1, and, commencing on the point 4 in Fig. 6, step from one arc to the next until the point 1 is obtained. Draw a line

from 1^1 to 13. Now with B A in side elevation, Fig. 1, as radius, and 13 of Fig. 6 as center, describe the arc 14. Then with 1 14 of Fig. 5 as radius, and 1^1 of Fig. 6 as center, intersect the arc 14, as shown. Now with the various hypotenuses in Fig. 5 as radii, and with 14 of Fig. 6 as center, describe arcs as shown by 12, 10 and 11. Set the dividers equal to the divisions on the circle in Fig.

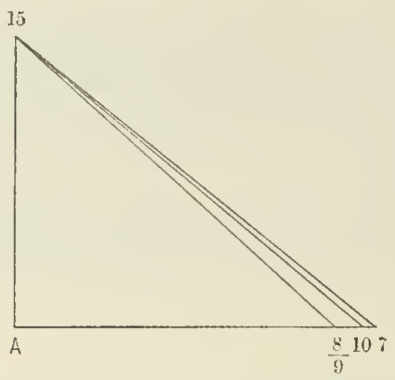


Fig 4.—Diagram of Triangles on Solid Lines in 7 10 15 of Fig. 1.

1, and, commencing at the point 1^1 of Fig. 6, step from one arc to another until the point 10^1 is obtained. Draw a line from 10^1 to 14. Now with 14 15 in plan, Fig. 1, as radius, and 14 of Fig. 6 as center, draw the arc 15^1. Then with 10 15 of Fig. 4 as radius, and 10^1 of Fig. 6 as center,

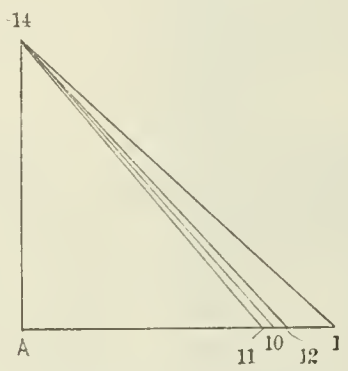


Fig. 5.—Diagram of Triangles on Solid Lines in 1 10 14 of Fig. 1.

intersect the previous arc, 15^1. Draw a line from 10^1 to 15^1 and from 15^1 to 14.

Now with the various hypotenuses in Fig. 3 as radii, and 16 of Fig. 6 as center, describe arcs shown by 5, 6 and 7. Step off the distances from arc to arc, as before explained, until the point 7^1 is obtained. Draw a line from 7^1 to 16. Now with B A in side view, Fig. 1, as radius, and 16 of Fig. 6 as center, describe the arc 15. Then with 7 15, Fig. 4, as radius, and 7^1, Fig. 6, as center, intersect the arc 15. Now with the various hypotenuses in Fig. 4 as radii, and 15 of Fig. 6 as center, describe arcs shown by 10, 9 and 8. Step off from arc to arc, as before explained, until the point 10^2 is obtained. Draw a line from 10^2 to 15 and 15 to 16, which completes the pattern. Now trace a line through the intersection on the arcs, as shown by 10^1, 1^1, 4, 7^1 and 10^2. Then will 10^1 4 10^2 15 16 13 14 15^1 be the full pattern, with the seam coming on the line 10 15 in plan, Fig. 1. The round pipe above D C in elevation requires no pattern, as the end of the pipe is a right angle.

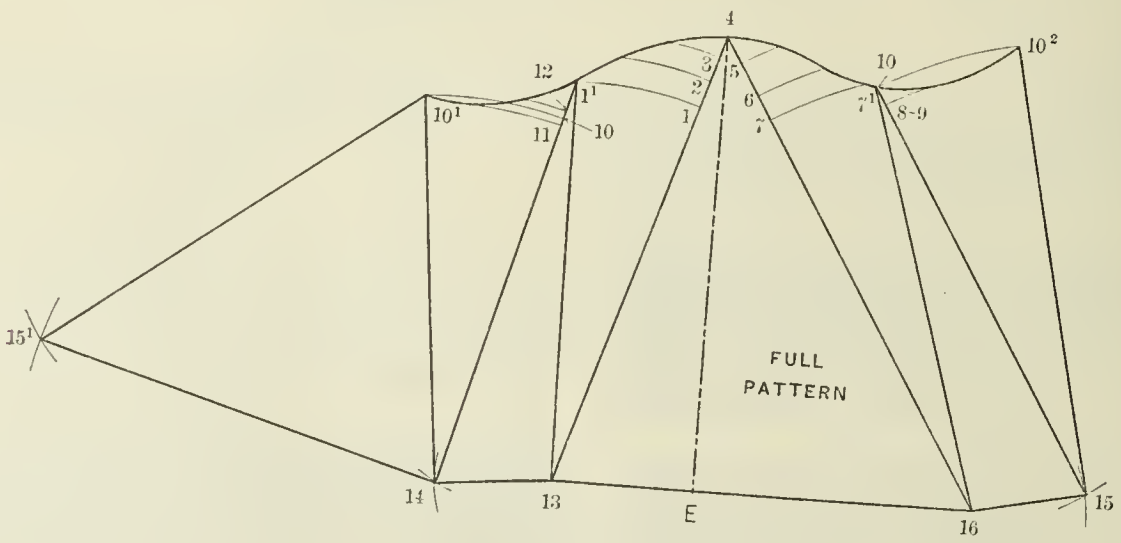
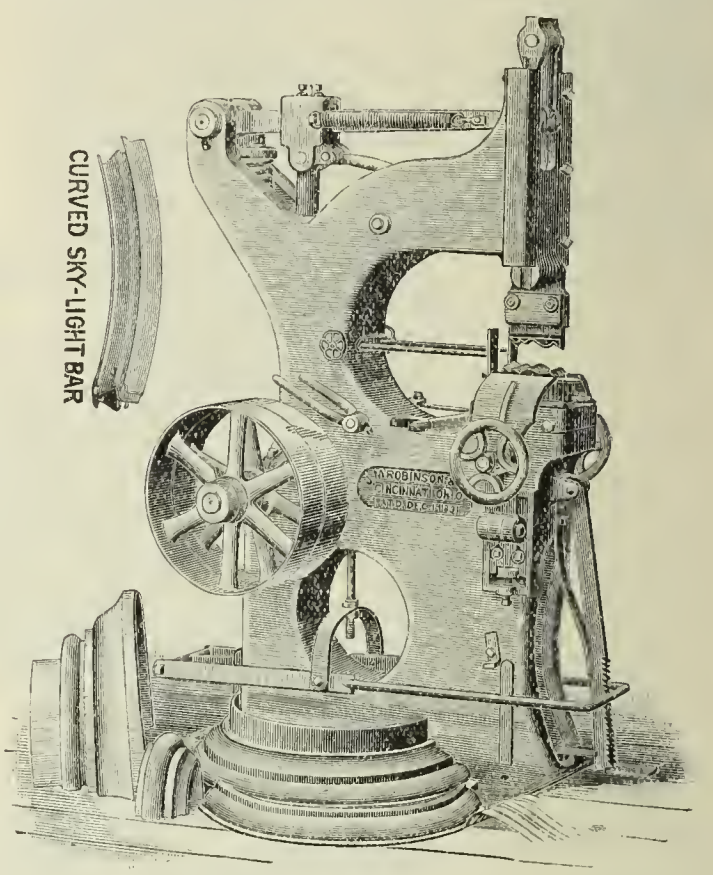


Fig. 6.—The Pattern Shape.

Machine Made Curved Skylight Bars.

All those who have to do with making skylights will be greatly interested in the adaptation made by J. M. Robinson & Co., Cincinnati, Ohio, of their curved molding machine to turn out a product of this sort, since there has long been a demand for machinery for producing curved skylight bars in place of the old process with mallet and wooden mold block. Robinson & Co., after some experimenting, have succeeded in producing perfect skylight bars with 6-foot radii, several samples of which sent out for inspection called forth very strong letters of approval. The accompanying illustration shows the machine, and also a separate view of the bar, and indicates the process of manufacture.



Machine Made Curved Skylight Bars.

To make the bars sheets are prepared by being cut to the required radii and width. Two of these sheets are

placed together and formed, after which they are separated and the top lap formed, one sheet being, however, wider for the lap. Next the two sheets thus formed are put together and the lap is closed over, thus securing the main bar. For the top cap plain sheets of the required length and width are taken and a small bend turned on the outer edges with a cornice brake. They are then hammered into shape with the curved molding machine, using suitable dies, thus completing the cap. For the bottom or clamp, cut sheets the proper length and width and bend an angle on the outer edges, finishing with the machine and dies, thus completing the skylight bar, cap and bottom clamp. The sample bar, for which we are indebted to J. M. Robinson & Co., illustrates the neatness and accuracy of the work done in this way, and would win the approbation of the most critical skylight maker.

FLASHINGS.

The firm of Watrous & Co., Troy, N. Y., consisting of Earl G. Watrous and Dennis J. Whelan, have been dissolved and Mr. Whelan has purchased all the property and assets which belonged to the late firm, including all accounts, and will continue the business under the name of D. J. Whelan. The business is the manufacture of Gutter Formers, Rotary Slitting Machines and Sheet Metal Machinery.

Gunster & Forsythe, Scranton, Pa., have done a fine piece of Architectural Sheet Metal work on the new department store building of Jonas Long's Sons. The building fronts on two streets, each front being 125 feet long, with an ornamental tower near the center.

Clark & Fischer are opening a Sheet Metal workshop for the purpose of manufacturing Sheet Metal Cornices, Clark's Sheet Metal Baskets, and to do all kinds of job work in those lines, at 714 West Locust street, Des Moines, Iowa.

Gara, McGinley & Co., 23 South Seventeenth street, Philadelphia, Pa., favor us with a folding advertising sheet, illustrating with fine half-tone engravings some of the Sheet Metal work which they do. The illustrations refer to interior work for ceilings and side walls. They present many different designs and two large interiors showing the application of the designs to ceilings in residences.

The Reeves Iron Company, Canal Dover, Ohio, will put their sheet mills in operation in a short time. This firm have recently made some extensive additions to their equipment which have considerably increased their capacity.

The Cambridge Iron & Steel Company of Cambridge, Ohio, manufacturers of Galvanized and Black Sheets, have decided to enlarge their plant by adding four additional trains of sheet rolls, consisting of two sets finishing rolls, one set roughing and one set cold rolls. The specialty of the company is galvanized sheet iron, the excellence of which has created a demand that necessitates the above extension.

N. & G. Taylor Company, Philadelphia, have lately furnished the largest ventilator we have ever heard of. It has a total diameter of 18 feet over all, the diameter of the neck being 10 feet. It is on the Midland Beach Casino, at Midland Beach, Staten Island. It is the Pancoast make, which appears to be giving such great satisfaction throughout the United States. This same make of ventilator was also used on the new Astoria Hotel, New York City.

A New Aluminum Solder.

We have received from Grant Hammond, 44 Chronicle Building, San Francisco, Cal., a circular giving particulars in regard to Hammond's solder and flux for brazing aluminum, which he is now placing on the market. Accompanying the same were several samples of aluminum with the edges joined by the new solder, including a piece of tubing, which, it is explained, was hammered into shape before brazing and subsequently spun and polished. The joints in the samples appear to be perfectly tight, and the tubing, in particular, presents an unbroken surface, looking as if it was actually seamless. Mr. Hammond states, nevertheless, that the brazing was done in an ordinary gas burner and is consequently not as neat a job as it would be with proper appliances. In this solder the inventor claims to have discovered a perfectly satisfactory and practical joining material for aluminum, and he predicts that aluminum ware, like silver, will in the near future be placed on the market with the edges brazed, they being butted together and no lap found necessary.

In support of his claims Mr. Hammond writes as follows: "Aluminum being a metal of nearly the same appearance as silver, and, like it, capable of assuming a high polish, it should be joined by a solder which will in no way detract from nor disfigure the looks of the article to be constructed. It seems that the great difficulty of joining the edges of aluminum satisfactorily has been not so much with the solders employed but for the want of a suitable flux. Chlorine, or a chloride in any form, will attack the metal. While in some forms it seems to give satisfactory results, still it is only for the time being, as joints so made will deteriorate and come loose. This is due either to electrical or chemical action, probably the latter, as the solder that has been used in such work is brittle from oxidation. This being the case, the flux then to be employed is one which will not attack the metal to remove the oxidation on the surface, but one which—the oxidation being otherwise removed—will absorb the oxide which always forms when heating the metal, and will evolve a greater heat along the seam where the metal is to be joined, and by chemical action will expel the oxide absorbed and alloy the edges of the metal.

"I have arrived at some definite conclusions in regard to alloys for soldering aluminum and for other purposes. I find that zinc is a metal that should not be used in alloys for soldering, if avoidable, as oxidation sets in until complete disintegration is effected. Inclosed * is a sample which when fused and rolled was a tough, tenacious alloy, but which in three months' time is as brittle as a piece of rotten bark, proving conclusively my above statement. Aluminum properly soldered with my solder will be as lasting as any of the other metals, and a man who is familiar with the use of solders, such as silver, spelter, &c., will be as successful with this after a few trials."

The following directions are given for using the solder and flux:

No lap is required in brazing aluminum with this solder. All that is necessary is to scrape the edges on ends, and the sides for not more than 1-32 inch back on both sides, making them thoroughly clean and bright, and making the ends fit perfectly; cut off a narrow strip of solder of the length required, scrape it clean and bright, and place it between the ends to be joined, they being butted together. Now, with a flat piece of wood or glass, place a considerable quantity of the flux along the seam—the operator will soon find out about the quantity of the flux to use. It is best to start in with a large quantity, then keep decreasing the amount with each experiment until the least quantity necessary for good work is ascertained. The strip of solder should be wide enough to project a trifle on each side. If the metal to be joined, for illustration, is 1-32 inch thick, the solder should be at least 1-16 inch, or double in width the thickness of the metal. In heavy metal it need only project about the same distance past each side as for brazing the above.

Everything being prepared as above stated, the metal is ready for heating, which can be done in almost any flame free from soot or smoke—gas, gasoline or heat from a brazier hearth. The heat should be applied from the opposite side to that on which the flux is placed. The higher the heat the better, so long as the metal is not injured. The amount can generally be told after a few trials, by spots of fire appearing along the seam. After these have stopped coming, and all smoke has disappeared from the seam, the union of the metal has been effected and further heat is unnecessary.

Heat should be applied the full length of the seam at once; that is, if the seam is 1 foot long, the flame should be nearly the same length, although the work could be done by passing backward and forward through a smaller one. Small work may be conveniently brazed by using a blowpipe. Blow holes may be filled by scraping clean, laying on a piece of solder, putting on flux, and heating. In doing the above there should be a large enough piece of solder to fill the hole, and it should also be forced into it or made to fit perfectly.

The metal does not need to be lapped, no matter how thin it is, as a butt joint is all that is necessary. The edges of aluminum 4-1000 inch in thickness can successfully be joined.

Aluminum can be brazed to almost any metal but iron, Mr. Hammond says, with his solder and flux.

The Navy Department at Washington has received information to the effect that a contract has been placed with an English firm for three new torpedo boats for the Russian Navy that will be easily the fastest war craft in the world. Their minimum speed capacity is placed at 38 knots per hour. As this immense speed will demand greater power than can be supplied by the ordinary type of torpedo boat engines, the craft are to be driven by steam turbines, having four separate shafts with three propellers on each shaft.

* The piece of metal referred to was found to be as brittle as the writer states.

HEATING AND PLUMBING.

The Correct View of the Situation.

The importance of having plumbing systems correctly planned and properly executed is conceded by those who are conversant with the subject. Good sanitary conditions in the home and business place are a public benefit, and those who labor to that end are to be commended. This is the correct view to take of the situation presented by the plumbers who are at work all over the country to secure legislation or agreements that will cause all plumbing work to be of a sanitary character. The plumbers have been specially active this year in their endeavors to have the work controlled by regulations and inspected by a competent official and to be done by men who under official examination have demonstrated their qualification for such work. In the absence of statute law they have endeavored to effect agreements that will control the sale of goods with the same object in view. They have been hampered in the accomplishment of this end by enthusiasts who take the narrow view of personal benefit and by their ill-advised remarks afford an opportunity for a wrong impression to be formed. This impression, though entirely wrong, is intensified by those who, though in the trade, do not sympathize with the work. As a consequence the effort to elevate the standard of plumbing work to the benefit of all has brought it prominently before the public. Those who do not look beyond the present struggle see only the strife as presented by the local press, which, unfortunately, has seen fit to present the case from a sensational standpoint. Throughout the country at the present time the work of the plumbers is receiving a great deal of attention, and much of the adverse criticism is due to a want of thorough knowledge of it. In some instances law suits have been started to test laws enacted and to find if the methods employed in some cases are not infractions of the rights of others. The vigor with which these cases are pressed would be relaxed if the indiscreet plumber had been more careful in his remarks and explanatory methods had been used instead of coercive methods, for the plan of "reasoning together" has prevented serious friction in the largest cities in the country. The tenacity of the trade to their purpose, which is commendable when viewed from the proper standpoint, is remarkable in view of the discouragements that have been met.

Milwaukee Plumbers' Examination.

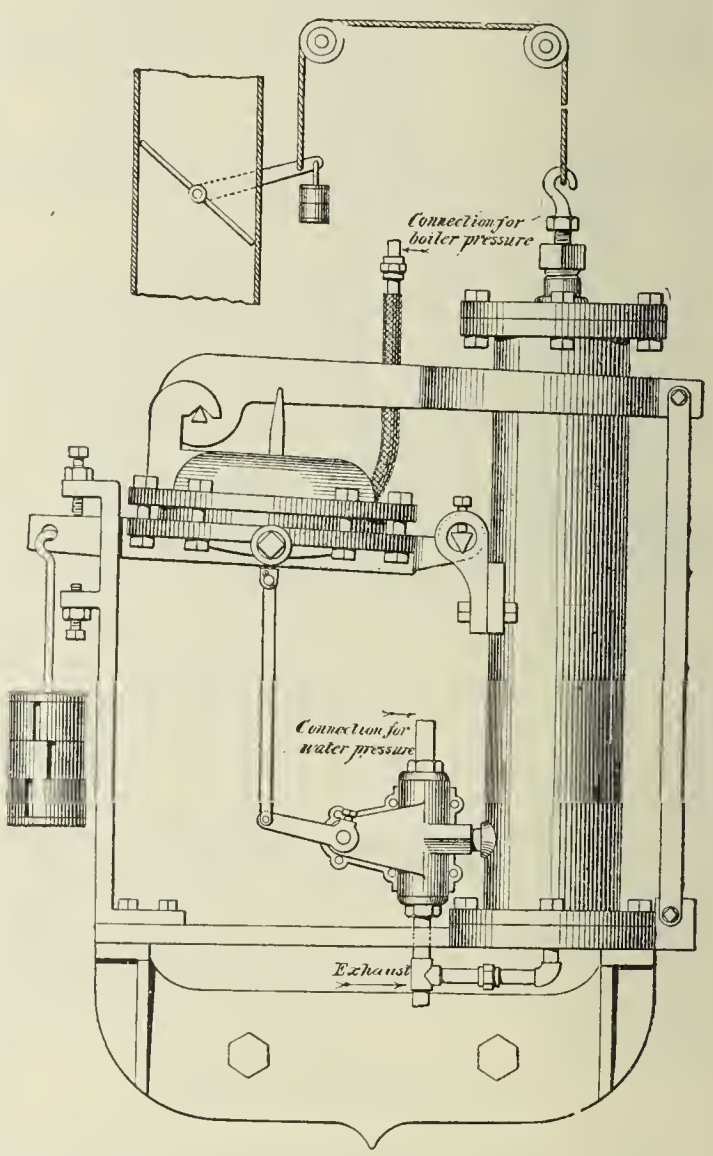
The examination of master plumbers of Milwaukee, Wis., by the commission comprising the members of the Board of Public Works—Plumbing Inspector B. O. Reilly and F. W. Pripps—was held yesterday and to-day, December 10 and 11, while the journeymen plumbers will be examined on December 13, 14 and 15. The questions that the plumbers will have to answer have been carefully prepared by Messrs. Reilly and Pripps, subject to the approval of the entire commission. The plumbers, after passing the examination, will have to take out a license, for which they will pay $1 each. The law requiring the plumbers to be examined and licensed is the creation of the master plumbers themselves, and its effect will be awaited with much interest.

Fernando W. Pripps, secretary of the commission, states that from 250 to 300 journeymen plumbers have expressed a desire to take the examination, and 125 to 150 master plumbers.

Giblin & Co., Utica, N. Y., report their Boiler business unusually good for the past three months and are now obliged to run overtime in order to fill orders. Among the recent sales of Standard Sectional Boilers, made by themselves or their representatives, are the following, in which Steam Boilers have been selected: Norwood Hotel, Auburn, N. Y.; Norwood, R. I., schoolhouse; residence S. F. Littlefield, Wakefield, Mass.; residence John Baty, Dover, N. H.; sanitarium at Penacook, N. H.; residence Robert Lehman, Tacoma, Wash. In the residence of T. B. Rowell, Beaver Dam, Wis., and greenhouse of George Boyce, Utica, N. Y., Hot Water Heaters will be used.

The Improved Climax Damper Regulator.

In the accompanying illustration we present the Improved Climax damper regulator, manufactured by Kieley & Mueller, 11 West Thirteenth street, New York City. It is designed for use with steam boilers for so controlling the draft as to maintain a uniform pressure of steam, and is said to be so sensitive in its operation that it will work on ½ pound fluctuation in the pressure. As will be seen



The Improved Climax Damper Regulator.

by the illustration presented herewith, a connection is made from the boiler to the diaphragm, so that in case the steam falls below a desirable pressure the weights will operate the lever controlling the valve which operates the piston connected with the damper by means of water pressure. A slight reduction in the steam pressure which causes the downward movement of the diaphragm operates the valve, shutting off the water supply and allowing the water in the piston chamber to escape. The weight attached to the damper lever then is sufficient to raise the piston and open the damper to increase the fire and raise the steam pressure. The device may be set to work under any pressure, weights being provided for this purpose and set screws being provided for a still closer adjustment. The water used in operating the damper may be either taken from the house supply or in instances where there is no such supply a connection may be made with the boiler below the water line for the purpose. This valve is now in use in a number of large buildings in New York City, where during the day it is only necessary to produce

a sufficient quantity of steam to run the elevators and a few of the electric lights, while in the latter portion of the day and evening steam pressure must be developed sufficient to carry the entire lighting system of the building. It is pointed out that under such conditions it effects a saving in fuel and secures a more satisfactory service through maintaining a steady pressure and relieving the various parts of the machinery from the strains that ensue when the pressure is variable. The construction is said to provide against corrosion and undue friction, so that the sensitiveness of the regulator will continue after long service.

Laying Gas Pipe.

Those who have experienced the vexation of their customers at having their lawns cut up and more or less disfigured by the process of pipe laying will find the method described by Charles Lurcott in the *Scientific American* of practical interest. Mr. Lurcott was desirous of putting in the gas in his amateur workshop, which is 24 feet distant from the house. To avoid digging the customary trench across the lawn, and the permanent disfigurement which follows, he determined to bore a hole through the soil from the cellar to a point below the floor of the shop. The boring apparatus was extemporized out of a piece of 3-16 inch flat iron, a ¾ bar, some 6 foot lengths of piping and a carpenters' brace. The flat iron, 3-16 x 1 inch and 2 feet long, was bent cold with a twist of half a turn in 6 inches at one end, the other end being scarfed and riveted to a 6-foot length of ¾-inch round iron. The opposite end of the ¾-inch iron was threaded into a ⅜ inch pipe coupling, and with the addition of three 6-foot lengths of ⅜-inch pipe and couplings the apparatus was complete. To connect the carpenters' brace with each piece of pipe as the boring proceeded, a short length of ¼-inch pipe was screwed into a ⅜-inch cap, its other end being filed square so as to enter the brace. With this simple and cheap boring machine completed all that was necessary was to remove a stone in the cellar wall and commence boring. The auger cut its way rapidly through the soil and in just 15 minutes a hole large enough for an inch gas pipe was made for the required distance of 24 feet. The auger cut its way without any tendency to swerve out of line, and had any rocks been encountered it would have been easy to dig down and remove them.

It should be added that the ground at the time was frozen and covered with snow, and any one who has had to dig a trench under such circumstances will appreciate the saving of labor attending the methods of pipe laying employed by Mr. Lurcott.

Plumbing Laws in San Francisco.

We have the following letter from John L. E. Firmin, San Francisco, under date of December 3, which the trade throughout the country will be interested in reading. The San Francisco plumbers are having a hard fight, but they appear to have right on their side, and the side with right on it is sure to win in the long run. The wave of plumbing laws which has swept across the continent is not going to stop at the Sierra Nevada Mountains, and if it should hesitate there Mr. Firmin can rest assured there are many in the East who will do what they can to push the tide of reform clear to the Pacific Ocean :

A great battle is now on between the Board of Health and the Association of Master Plumbers of this city (as representing the march of sanitary science and its practical application) on the one side. On the other side are the real estate agents (who claim to represent the interests and welfare of 75 per cent. of our citizens), who have organized with the especial purpose of defeating and destroying the rules and regulations formulated by the Board of Health for the protection of our citizens against preventable disease, as comprehended in accepted, logical and just rules and regulations governing plumbing. The especial features which the real estate agents would attack are the registration of plumbers, filing of plans, and the jurisdiction of the Health Depatrment over any class of plumbing not coming under the head of "buildings hereafter erected." Practically, they would nullify the results of the sanitary legislation of the past 16 years.

For past week skirmishing all along the line; to-day, first battle. Have consented to a continuance of 30 days, so as to permit of a full hearing of the question. A certain daily paper, the *Chronicle* (an old enemy), for the past week has published columns of the most outrageous abuse of the advocates of plumbing legislation, claiming we are fit candidates for the State's Prison, &c. The entire press, so far, has been closed against us, and would not print our views, either as news or as paid advertisements, even at exorbitant rates. Considering the great advertising patronage of the real estate agents we dare hardly hope for a fair voicing of our views through the daily press. We trust, however, that a sense of their duty to humanity, and a regard of public weal, will cause them to at least give space to both sides. In spite of all obstacles we shall continue the fight, and to a finish. We know we are right, and feel certain of the support of the true public opinion. We are satisfied we shall win, no matter what guise may be assumed by pretending public benefactors.

You of the East would be surprised to note the lack in our rules of certain essential features of sanitation. For instance, as yet we have been unable to apply a "final test" rule to our work (new or old).

Selling Boilers by the Pound.—The question is brought up by some manufacturers of steam and hot water house heating apparatus whether it would not be a good idea for them to make a pound price on their heaters. The claim is advanced that the craze for cheapness has caused castings to be made thinner and thinner, to reduce the cost of the apparatus. This has been at the expense of durability, but that is lost sight of in a comparison of prices by the builder or house owner. Those who favor the pound price believe that if a buyer should be given his choice at a rate per pound, he would be less likely to take the lighter article, as the cause of its cheapness would thus be made plain to him.

NOTES.

The Hartford Heater Company, Hartford, Conn., have been awarded the contract for a steam heating system for the First Baptist Church.

J. A. Allen, Des Moines, Iowa, has removed his plumbing establishment to 518 East Walnut street, where he will carry a line of supplies for plumbers and gas fitters and also a line of Electric Goods.

A number of Minneapolis plumbers have recently changed their local address. The Worthingham Plumbing Company are now at 209 South Third street, W. S. Bayley has moved to 58 South Seventh street and George S. Lyon is now established at 426 South Sixth street.

The Cleveland Automatic Gas Machine Company have favored us with a copy of their latest catalogue of their machine for the manufacture of gas on the premises of the owner. The machines are made in different sizes, adapted for residences or for larger buildings and factories. Engravings show kitchens in which gas ranges are run with gas and other engravings show a number of solder furnaces in a factory and the gas lights for illuminating the workshop, all of which gas is supplied by their machine. The gas is automatically generated from gasoline, a suitable tank for storing the gasoline being buried at a convenient distance from the building, the gas making apparatus being located in the basement where attention can readily be given to it. A feature of the catalogue is a large number of testimonial letters from those who have used the machine with good results in various sections of the country.

In some of the modern bathrooms where luxury predominates a platform scale of fine finish is one of the fixtures for the convenience of those who wish to keep informed as to their weight.

W. W. Griffiths of the firm of Griffiths, Niedermayer & McGuckin, 1015 Christian street, Philadelphia, was a recent visitor to *The Metal Worker* office. Mr. Griffiths reports that the demand for the IXL Beer Pump is increasing and that good reports come from its operation all over the country.

O. C. Knox has sold his plumbing business on Exchange street, Chicopee, Mass., to Edward and Charles O'Brien.

Blake & Murphy, Moline, Ill., have purchased a lot on which they propose to erect a plumbing establishment.

James F. Cahill has been appointed Plumbing Inspector of Utica, N. Y.

The Cincinnati Chapter of Architects are giving considerable attention to plumbing and at their next meeting a paper on modern plumbing will be read by Richard Murphy, a well-known plumber.

R. H. Walker, Elmira, N. Y., has recently completed the heating and plumbing of the Bradford County House at Towanda, Pa.

The Naugatuck Mfg. Company, Naugatuck, Conn., manufacturers of Seamless Copper Ball Floats for receivers, steam traps, regulators and for open tanks for plumbers' use, advise us that business has increased to such an

extent that they have been compelled to seek larger quarters. They are now located in a well equipped and much larger factory near the business section of the city.

The new building of Jonas Long's Sons, at Scranton, Pa., was equipped with a power and electric plant by Francis Bros. & Jellett, Philadelphia and New York, who furnished Boilers of 300 horse-power. The heating work was done by Gaylord & Eitapenc, Binghamton, N. Y., and the plumbing by P. F. & M. F. Howley, Scranton.

C. L. Smith has opened a plumbing shop at 24 West Eighth street, Anderson, Ind. A special feature of his opening was the reservation of the time from 2 to 5 in the afternoon for the reception of ladies.

Mayor Harrison of Chicago, Ill., has appointed the following board to examine and license plumbers in accordance with the new State law: Commissioner of Health J. Reynolds; Charles Brewer, a master plumber; Frank Kennedy, a journeyman plumber, and Andrew Young, Chief Sanitary Inspector of the Department of Health.

L. Farenthold, Jr., plumber and hardware dealer, Weimar, Texas, has gone out of business.

Walter Hutchinson has been elected Inspector of Plumbing at Norristown, Pa.

A circular of the O. S. Distributing Fitting is received from 111 Beekman street, the New York office of Oliver Schlemmer, Cincinnati, Ohio, which shows clearly how time, material and labor may be saved and better work accomplished by its use. It is hardly necessary to read the text, for the illustrations present the advantages for use on hot water work so that they cannot be misunderstood. Another circular shows the benefit of the Temple Vent Fittings to the plumber with an equal clearness.

Hon. W. C. Whitney, ex-Secretary of the United States Navy, is building a palatial residence for his winter home, at Aiken, S. C., and is equipping it with the best modern sanitary appliances. A hot water heating plant is now being installed by Geo. B. Cobb, Jr., superintendent for the Geo. B. Cobb Company, heating and ventilating engineers, 44 Centre street, New York. Mr. Cobb is to be congratulated on having charge of such an important piece of work.

The Hawks Hardware Company, Goshen, Ind., have secured some big Michigan contracts through their representative, C. H. Maloney. They were awarded a contract for heating and plumbing the Arlington Hotel, Petoskey, Mich., and have secured a contract for heating a hotel at Sheboygan, Mich. These two contracts aggregate about $3000. During the past four months the company have secured about $8000 worth of contracts outside of Goshen for heating and plumbing.

A plumber who was proceeded against for doing work at La Crosse, Wis., without a license, defended his action by pleading that the State law was unconstitutional. The judge decided the law was constitutional and inflicted a fine.

Edwin S. Summons, 209 North Sixth street, Reading, Pa., has taken into partnership Elmer J. Cake and H. W. Brossman, and the firm will be known as the E. S. Summons Plumbing & Heating Company. Mr. Cake was in the employ of Mr. Summons for 20 years, and Mr. Brossman is a well-known bookkeeper.

Samuel Whitcomb has received a plumbers' license and will engage in the business for himself at Bellefontaine, Ohio.

An amendment has been passed in Minneapolis, Minn., to the plumbing ordinance requiring that all applicants for plumbers' license shall present a certificate of competency from the State Board of Commissioners of Practical Plumbing.

Henry H. Guernsey, New Haven, Conn., was in New York this week, visiting the trade preparatory to engaging in steam and hot water heating as another branch to his business.

The semi-annual meeting of the National Association of Master Plumbers of Great Britain and Ireland was held at Bradford November 10, and was largely attended. The reports of the meeting show a lively interest in association matters and an increasing strength and usefulness. The association is following the methods that have proven successful in the United States.

The declaring invalid of the St. Louis, Mo., smoke abatement ordinance, says a St. Louis paper, by the Supreme Court, will prove a severe blow to the progress of St. Louis unless some method is found to mitigate the effect which is sure to follow the decision. As a result of the activity of the Smoke Abatement Association in St. Louis, a marked improvement in the atmosphere of the city took place. Smoke consumers were put on thousands of the big furnaces in the center of the city, and the smoke blanket which blackened St. Louisians internally and externally was lifted. Will the blanket be put back, now that the smoke abatement law has been knocked out? It is to be hoped that other means will promptly be devised to maintain the gains made by the smoke crusade up to the present.

Samuel Holmes.

Samuel Holmes died at Montclair, N. J., on December 9, at the age of 75 years. He was born at Waterbury, Conn., and in early life connected himself with the Scovill Mfg. Company, subsequently becoming the manager of their New York City branch, which position he held until 1873. In 1876 he became treasurer of the Bridgeport Brass Company, and acted as their New York representative, from which place he retired in 1890. Mr. Holmes for over 50 years took an active interest in religious, educational and philanthropic work. He leaves a widow, four daughters and one son.

Paper Bottles.

A German paper maker, says an exchange, has recently obtained letters patent on bottles made of paper, for use on board of ships particularly. In bad weather much damage has been done by the breaking of bottles of wine and other liquors in the storerooms of vessels, in spite of every precaution. The new bottles are made of a composition which, with the solution in which they are made water tight, is still the inventor's secret. After being impregnated with this fluid the paper bottles are slowly dried in gas stoves, this process of drying being watched carefully, otherwise the bottles would remain porous and allow the fluid contents to leak out. These bottles can be handled very roughly without the least apprehension of damage or destruction.

A New Tinting Process.

A new process has been introduced in Paris, says an exchange, for giving pottery, wood, glass, metal and paper the tints of the soap bubble. The colors of soap bubbles are due to the film of water causing some of the waves of light reflected from its inner and outer surface to cancel each other and produce tints. The same effect is seen in films of oil or tar on water, in scales of old glass and in pearls. Hitherto the process of coloring in the same way has been applied only to paper, but it is to be extended to many other substances. A thin plate of transparent liquid, consisting of turpentine or rectified benzine, containing a little gum damar, if the paper is white, and Judean bitumen if it is black, is spread over the wetted paper. When dried on the surface this film gives a rainbow or iridescent appearance to the paper.

Standard Foundry Supply Company have been organized for the manufacture and sale of Foundry Cupolas, Center Blast Tuyeres and Castings of all kinds, with the business office at Rutherford, N. J., with capital stock $125,000, divided into 2500 shares of $50 each, and to start business with $5500. Incorporators: W. J. Cole, Rutherford; W. K. Cessna, New York City; John M. Scott, Ithaca, N. Y.

Years of experience have prompted an iron manufacturer to remark that it is a peculiar characteristic of the iron and steel business that as soon as orders fall off the manufacturer or merchant acts as if the world had suddenly decided to quit using iron.

The November fire loss of the United States and Canada, as computed by the New York *Journal of Commerce*, amounted to $7,189,800. This is about $2,000,000 greater than the sum charged against the same month in 1896, which showed exceptionally light losses, but it is $3,000,000 less than in November, 1895. The total fire loss for the 11 months ended November 30, 1897, is $98,991,000, against $104,293,500 in the same months of 1896 and $119,820,900 in 1895. Unless some conflagration running up into millions takes place this month the year 1897 will show a great reduction in fire loss in comparison with 1895, and will be materially less than the record of 1896. The fire underwriters, says the *Journal of Commerce*, have had a very fortunate year, as they have maintained high rates at nearly all points throughout the United States. Their forthcoming annual statements will probably show that 1897 has been for them the banner year of the decade.

Sydney H. McLane is building a small steel steamer at Ballard, Wash., for the Yukon Commercial Company, to be used in the Yukon river trade. The builder purchased his shipyard machinery in Chicago.

TIN PLATES.

Tin Plate Machinery.

A large catalogue has been received from the Frank-Kneeland Machine Company of Pittsburgh, engineers, founders, machinists and manufacturers of tin plate and sheet mills. The property of this company is well located for convenient receipt and shipment of supplies and finished product. The engineering and drafting departments are in the hands of men of long theoretical and practical training, and whose personal and financial interests are bound up in establishing engineering works second to none in the country. Complete records of all work are kept in fire proof vaults and parts can be duplicated at any time. The pattern department is under the supervision of one who knows how to produce these so-called expensive necessities with rapidity, and so designed that good castings can be made at reasonable cost. The foundry has capacity of 75 tons of iron per day, and is supplied with two 20 ton and one 7-ton electric traveling cranes. Core drying ovens, casting pits, cleaning barrels, elevator, plenty of daylight and head room are the main features. Tandem with, but separated by an area of 25 feet, and connected by a standard gauge track, is the roller machine department, covering 100 feet wide by 180 feet long, and having two galleries 20 feet wide. The clear lift under the cranes is 30 feet, the cranes being two 20-ton of the electric type. The latest improved lathe boring and turning machines capable of handling any class of work likely to be presented are provided. The roll department is located at one end of the machine shop building and is equipped with ten powerful lathes, including a lathe of special design for testing, heading and centering each roll whether it is to be shipped in the rough or to be finished by the company. These lathes are directly under and are served by the electric traveling cranes. The following portion of the catalogue contains engravings of roll turning lathes, shears and punches driven by steam or electricity or power. Following them are views of works which have been equipped by this company, the closing pages being devoted to structural mill housings, and bar and blooming mills, hydraulic, jib and whip cranes, &c.

New Tin Plate Plant in Ohio.

Wm. H. Banfield of Wallace, Banfield & Co., tin plate manufacturers, at Irondale, Ohio, has recently purchased about 20 acres of ground in East Liverpool, Ohio. It is the intention of Mr. Banfield, in connection with others, to erect on this site a six mill tin plate plant. It will be equipped with all modern machinery and will be a model plant throughout. Work on the erection of the plant is expected to commence shortly after the first of the year. It is the intention of Mr. Banfield to still retain his connection with the firm of Wallace, Banfield & Co., and he will continue as superintendent of the present plant at Irondale, and will also superintend the new plant at East Liverpool. The firm of Wallace, Banfield & Co., however, have no connection with the East Liverpool enterprise, and will not remove their office to that place as stated.

SCRAP.

The December calendar blotter issued by Follansbee Bros. Company, Pittsburgh, Pa., is of a seasonable character. The calendar is displayed on the bricks of a snow-capped chimney, and the main illustration—a child loaded with the gifts of Santa Claus—gives point to the catch-word, "Satisfaction," as applied also to the user of Scott's Extra Coated Roofing Tin.

The New Castle Steel & Tin Plate Company, New Castle, Pa., are reported to be equipping their hot mill plant throughout with 26-inch rolls in place of 24-inch. This is being done in order that the rolls may correspond in diameter to those now being built for the new Shenango Tin Plate Company, whose interests will be consolidated with those of the New Castle company.

O. M. Hartzell, who is actively connected with the recently formed Neshannock Steel & Tin Plate Company, New Castle, Pa., was in New York last week visiting the trade. Mr. Hartzell for some time past has been engaged in the Iron and Steel brokerage business in Pittsburgh, Pa.

Yet another Tin Plate plant is reported to be among the probabilities in the New Castle, Pa., district. Robert J. Scott, with other Pittsburgh capitalists, are said to be figuring on a six-mill works, to be erected somewhere between New Castle and Mahoningtown.

The Robinson Rea Mfg. Company, Pittsburgh, Pa., have received an order from the Monongahela Tin Plate Company of that city for five additional Tin Mills. This will increase the Monongahela works to a 16-mill plant. The whole plant will be remodeled, in both the hot mill and cold roll departments.

E. G. Lauck of Pittsburgh, Pa., has assumed charge as superintendent of the United States Iron & Tin Plate Mfg. Company's plant at Demmler, Pa.

President M. M. Garland of the Amalgamated Association of Iron and Steel Workers, who recently returned to Pittsburgh from a tour of inspection in Ohio, stated in an interview that he had found the Ohio Valley Tin Plate works generally busy and well filled with orders. He said that the indications are that the Tin Plate workmen will have steady employment through the winter.

The Tin Plate plant of the Stickney Iron Company, at Canton, Baltimore, Md., leased by the Humbert Tin Plate Company, is scheduled to begin operations next Monday. About 100 men will be employed at the works, half of whom will come from Pittsburgh and Connellsville, Pa.

The Crane brands of Roofing Tin form the subject matter of a neat circular issued by the Irondale Steel & Iron Company, Richmond, Ind., with works at Middletown, Ind. These Terne Plates are of three qualities—namely, Crane Old Style, with a guaranteed coating of 35 pounds to the box; Crane Extra Coated, with 20 pounds of coating guaranteed, and Crane, a Worcester Grade Plate. We are advised that the Tin Plate plant of the Irondale Steel & Iron Company is now in excellent condition and has been running to full capacity for several months past. The firm have a good business in Coke Tins for special purposes, where softness, good finish and accurate weights are required, and are also having a good trade in high grade Terne Plates.

The official Treasury figures of Tin Plate imports into the United States in the month of October, 1897, place the value of such imports at $203,031, as against $409,402 in October, 1896, a falling off of over 50 per cent.

The Question of Electric Wiring.

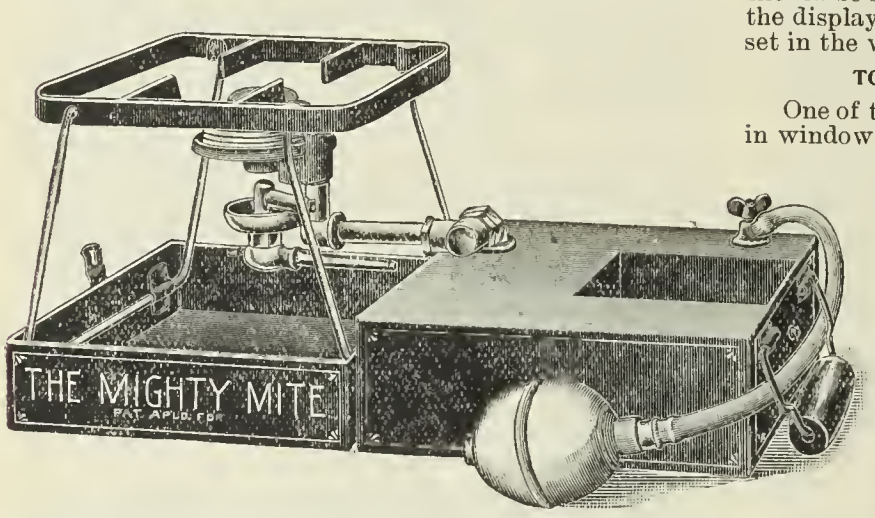
The question whether electric light wiring should be paid for by the consumer or by the electric lighting company has often been debated in the United States. England seems to have answered the problem satisfactorily by the adoption of a system known as "free wiring." The name is a misnomer, says the Boston *Journal of Commerce*, as the system really consists in making the consumer pay for the wiring on the installment plan; that is, by tacking on so much more to his monthly lighting bill. The idea of free wiring first originated with a syndicate which proposed to accept payment for the wiring of houses by a certain sum paid by the householder for every kilowatt hour of electrical energy metered to him, this sum being naturally in addition to that paid to the supply company in the usual course. This could only be done with the concurrence of the supply company, but it is easily imagined that this was not difficult to obtain. It is especially in the less wealthy residential districts that such a scheme finds favor. There are numbers of householders who consider it too extravagant to pay for the wiring of a house already, perhaps, fitted with gas pipes.

The recent remonstrance by a number of users of natural gas in Ontario, Canada, against the piping of Canadian gas into the United States has been followed by a counter movement on the part of the interests engaged in the traffic. Another deputation from the natural gas fields in the vicinity of Windsor, Ontario, recently waited on the Dominion Government. It consisted of owners of wells, who desire that there shall be no alteration of existing arrangements. They want to be free to continue piping the gas to Detroit.

THE RETAIL STORE.

The Mighty Mite Folding Gasoline Stove.

A novel folding gasoline stove is being introduced to the trade by the Mighty Mite Stove Company, Room 314 Northern Office Building, corner La Salle and Lake streets, Chicago, Ill. It is known as the Mighty Mite, and is of such construction that it can be readily folded into a box 7 x 7 x 3¾ inches and carried about in the same manner as one would carry a hand satchel. It is referred to as being especially adapted for hunting and fishing parties, for yachting and picnics, and for all who have occasion to do light housekeeping. Among its novel features may be mentioned the fact that it is so constructed as to render it impossible to fill the tank while the burner is lighted, for the reason that the instant one turn is given the filler plug to remove it, the air escapes and the flame goes out. The stoves are made of tin and brass, the tin ones being enameled and striped, while the brass ones are either burnished or nickel plated. The flame due to the pressure is said to be exceedingly hot, and that while an ordinary stove will boil a gallon of water in from five to eight minutes, the Mighty Mite will do it in five minutes. A single burner construction weighs only 5 pounds, and will heat for eight hours without refilling, while the double burner stove will heat for 12 hours without refilling. The statement is made that the double burner stoves have considerably more than twice the tank capacity of the single ones, and will fold into a box 7 x 17 x 3¾ inches, while the three-burner stove will fold into a box 7 x 26 x 3¾ inches. In Fig. 1 of the accompanying illustrations we show the appearance of one of the stoves open, ready for use, while in Fig. 2 is shown the stove folded into its box ready for carrying about.



The Mighty Mite Folding Gasoline Stove.—Fig. 1.—Stove Open Ready for Use

Fig. 2.—Stove Folded in Box for Carrying.

Window Display as a Means of Advertising a Store.

BY C. F. C.

One of the most important means of advertising connected with any store is its show windows. Within a comparatively short period of time this has become a recognized fact in nearly all lines of business. In retail Hardware, however, the development along this line has not been so marked as in other trades. This may be due to the fact that it is a difficult matter to make an effective window display of Hardware. There are very few, if any, goods in this line which can be draped as are the cloths in dry goods or clothing displays.

MINIMIZING THE DIFFICULTY.

This difficulty can be partially overcome by covering the floor of the window with black calico or "print," as it is known among dry goods men. This should not be confused with black cambric. The calico is a dead black, while the cambric has a shiny appearance that detracts from the goods and injures the eyes. Sometimes it is well to cover the side walls of the windows with this material also. Then by means of brass screw hooks bright goods can be made to stand out well thereon. By carefully placing these hooks small articles can be arranged to form letters or designs. Some goods will show to better advantage upon red cotton flannel than upon black calico, but the flannel is more expensive and less durable. The red soon fades and the cloth has to be replaced oftener than when black is used.

It is often well, when tacking cloth upon side walls, to drape it in folds instead of tacking it flat. This requires more material, but secures a more pliable and pleasing effect. In windows where heavy Hardware and Stoves are to be displayed, it is better to use a neat pattern of oilcloth or linoleum for a floor covering.

A handsome floor can be made with pieces of tiling which are often left from tiled fire places or floors. These pieces should be arranged systematically. A good plan is to use white for the center with perhaps three other colors carefully placed to form a border. These pieces are placed loosely on the floor of the window, and there is opportunity for great variation of design. The tiling can be washed with a damp sponge whenever the window is changed and cleaned. There is no handsomer floor than this upon which to show enamel bath wares and bathroom equipments. In showing these goods, however, they should be set up apparently ready for use. This makes the display much more attractive than if the goods are set in the window regardless of effect.

TOO MUCH VARIETY A COMMON MISTAKE.

One of the most common errors made by Hardwaremen in window trimming is the use of too great a variety of merchandise. A window, like an advertisement, should be simple and straightforward. It should show all that can be conveniently shown about some one article before it attempts more. True, a window trimmed with a great variety of goods may be exceedingly pretty, but prettiness alone is not effectiveness; it doesn't always sell goods. To illustrate this, the two window displays of a certain Hardware store noted recently will be good examples.

One window had as a center a revolving show rack that consisted of three round tin shelves mounted upon a center iron rod which ran through the rack and extended from the floor of the window to the top. This was kept revolving by a small electric motor that operated in plain view of the passers-by. The motor was supplied with electricity from batteries situated under the floor of the window. This rack was tastefully trimmed with light articles, and in itself was a good attraction, as a moving display nearly always arrests attention. But that was not all that the window contained. On the right was a Knife case containing nearly a gross of Knives of different sizes, shapes and finishes. On the right side wall were shelves filled with Agate Ware. Upon the left, a little toward the back, was a board covered with black calico, upon which several Electric Bells were displayed. From arms attached to the left side wall various articles of Tinware were shown. The floor of the window underneath and around the revolving center rack was occupied by numerous Kitchen Knives, Cleavers, &c., carefully arranged. This window had a neat, well kept appearance, but there is a doubt as to whether or not it was a good selling medium. The trouble lay in the fact that there was too much displayed. Although the goods were well arranged no one article predominated. In order to gain a definite idea of the contents of the window a person would have to stop and study it. This the public seldom does.

The other window was much plainer, and at first glance did not seem so attractive, yet it proved to be more

effective. The principal articles shown were Oil Heaters and Tubular Lanterns. The Lanterns were hung from racks in three rows across the back of the window. There were two colors, blue and plain tin. Each row was an alternate color. Two rows were hung from hooks in the ceiling of the window, the blue being hung outside and the tins back. These two rows were so arranged that one plain Lantern was shown between each two of the blue. This gave the top of the window the appearance of being hung more full, and at the same time relieved the monotony of rigidly straight rows. Each row of Lanterns was plainly marked with the price, which, by the way, was a special one. On the floor of the window were a number of Oil Heaters, arranged in semicircular form. This added more relief to the straight lines of Lanterns at the back. Three or four Lanterns, hung at irregular intervals, were all that the side walls could boast of. This window sold a great many Lanterns and several Oil Heaters.

Less work was expended upon it than upon the other. Less goods were used in its display. Yet the plain window was the more effective advertisment.

CHANGE DISPLAYS OFTEN.

Another fault of the average Hardware merchant is that he doesn't change his window displays often enough. Under ordinary circumstances windows should be cleaned and redressed at least once a week. Sometimes it is advisable to change them even oftener. It is as important to keep the show windows fresh and attractive as it is to keep newspaper advertising so. It's a good plan to make the show windows co-operate with the newspaper advertising. Goods which are being advertised in the papers should be displayed in the windows This plan will strengthen the newspaper advertisement and make it more effective. At the same time the advertisement can be made to call attention to the window displays.

Large show windows are not placed solely to beautify a building, nor for lighting purposes alone. Their purpose is to display goods. They're valuable advertising media, and as such they should be cared for in a way that will produce the best results.

The Proposed Enameled Ware Combination.

The situation concerning a consolidation of enameled ware and tinware interests appears to be about in the same condition as when last referred to. Conferences and consultations are still being held, and much energy is being put forth, but it is pretty certain that so far little other than negotiations of a preliminary character have occurred. There are rumors, more or less well authenticated, that the project is likely to assume definite form before the New Year, so far as four of the larger companies are concerned, with the expectation that later some who are still undecided will cast their lot with the new concern as soon as an equitable basis has been arrived at.

Johnson's Portable Harness Shop.

The accompanying cut represents a saddlers' horse and necessary tools, offered by Eugene L. Johnson, 33 Carlisle Building, Cincinnati, Ohio. The Portable Harness Shop, as it is called, includes a nicely finished box, 18 x 8 x 5 inches in size, with a lid or seat of solid oak, securely attached with wrought steel hinges. In one end of the lid a heavy iron socket is set flush with the top, and so arranged that the sewing clamp or vise may be put in position in a moment, solid and in proper position for either a right or left handed man, for sewing harness or filing a key, saw, &c. The clamp is made of iron, and is referred to as strong and serviceable, and neatly japanned. The point is made that when the operator is seated upon the box the weight of the body gives it solidity. The box is furnished with an adjustable sewing awl haft, saddlers' straight and bent awls, a wrench, paper of harness needles, ball of linen harness thread, shoemakers' wax, a box of bifurcated rivets, rivet set and a file. The shop is designed to retail for $2, and is recommended for the use of farmers, liverymen, ranchmen, coachmen and others.

Johnson's Portable Harness Shop.

Snap Shot Mouse Trap.

The Specialty Novelty Company, 43 East Marion street, Lancaster, Pa., are manufacturing the Snap Shot mouse trap here illustrated. It is made of a square block of wood with a hole on each of four sides. The main feature of this construction is the ease and rapidity with which each wire can be set, which is accomplished by raising the free end of the spring and resting it on a small projection punched in the loose metallic flap. Inside the hole is a steel pin on which to secure the bait. The mouse in pushing its head in so alters the position of

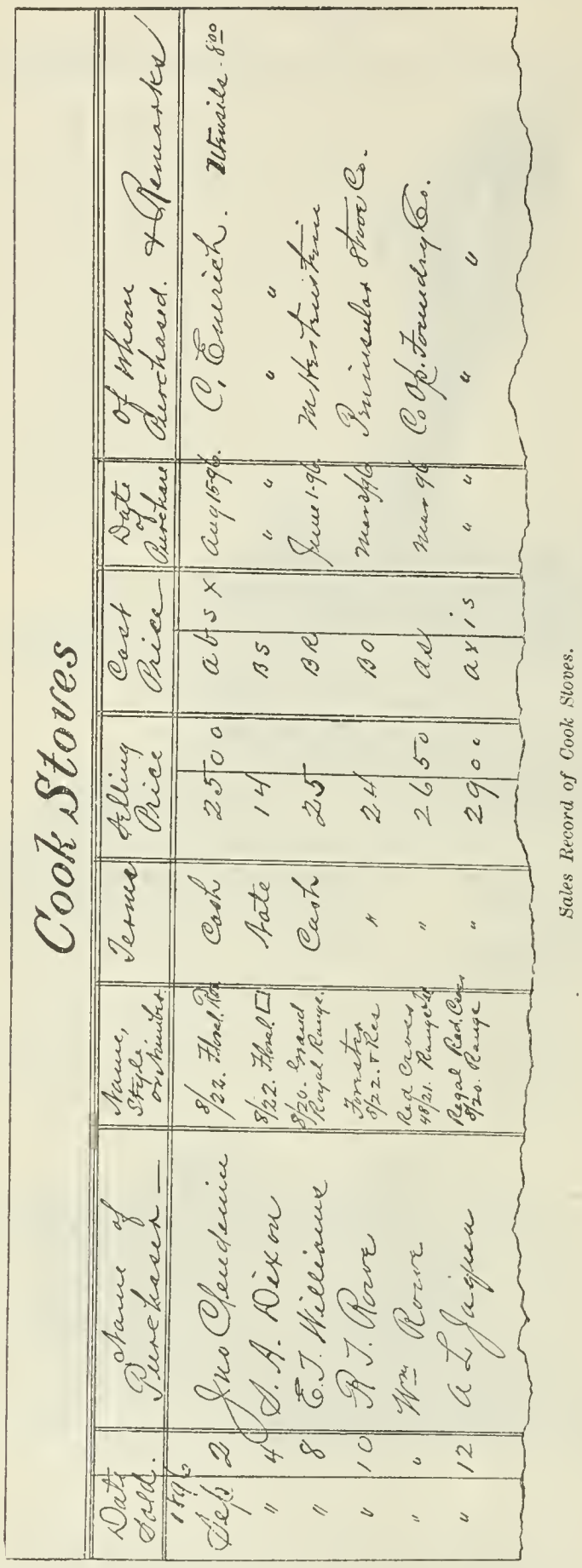
Snap Shot Mouse Trap.

the flap that the spring is released and the animal caught and killed without mutilation. The traps are finished in red. Allerton-Clarke Company, 97 Chambers street, New York, are general agents for this article and C. B. Corwin, 15 Whitehall street, New York, handles them for export.

Baldwin Refrigerators are the subject of a 44-page pamphlet issued by the Baldwin Refrigerator Company, Burlington, Vt. The extensive and well-known line of Refrigerators made by this concern are fully illustrated, descriptions are given wherever needful, and tables of sizes and prices are likewise presented, so that the dealer wishing to handle these goods can get all necessary particulars from the convenient pamphlet which the company distribute.

Sales Record of Cook Stoves.

The accompanying reproduction of a portion of a page from a sales record illustrates a system in use by the Fulton Hardware Company of Portland, Ind., for keeping a record of goods sold. A complete memorandum is thus presented of each Cook Stove sold—the date of the sale, name of the purchaser, name, style or number terms, selling price, cost, date of purchase, of whom purchased and remarks. This gives a condensed but comprehensive chronicle of the entire transaction, and it becomes of greater value every year as a reference book. From a record of this kind repairs for the article sold can be ordered at any time, without waiting for particulars to be furnished by the purchaser and the annoyance of delays and errors. At the end of each month or year the merchant can determine whether a certain line has been a profitable one, can see how many goods have been sold and note the most salable sizes, styles or kinds. The record is considered of sufficient importance by the company to justify them in recommending any merchant to have one made to order, of any desired capacity from one to ten years. Of course it should be kept up to date. The company use this form of record for Cook and Heating Stoves, Steel Ranges, Bicycles, Breaking Plows, Harrows, Walking and Riding Cultivators, Binders, Mowers, Wagons, Drills, Hay Rakes, Corn Planters, Hay Carriers, Refrigerators, Buggies, Carriages and Creameries. From two to ten pages of the record book is set aside for each of these lines of goods, and only one class of goods is entered on the same page.

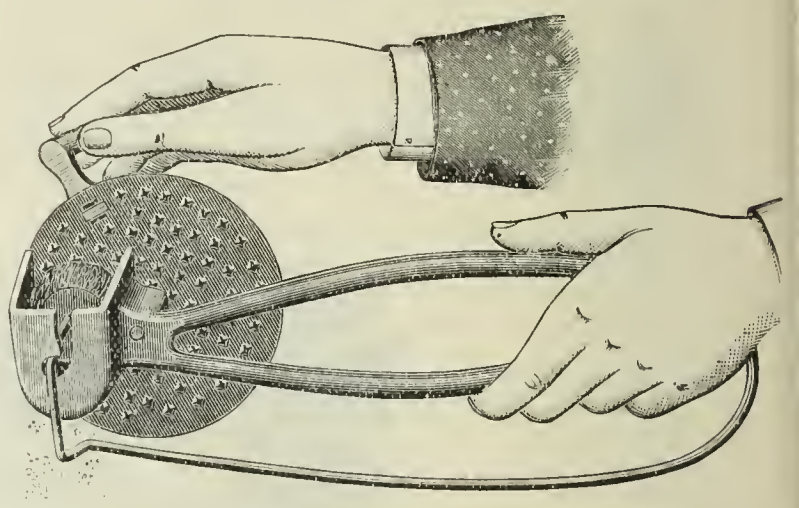

Cook Stoves.

Date Sold	Name of Purchaser	Name, Style or Number	Terms	Selling Price	Cost	Date Purchased	Of Whom Purchased. H. Pennsylvania
1896 Feb 2	Jno Pendleton	8/22. Hoosier	Cash	25 00		Aug 1896	C. Emrich. Wabash 8.00
" 4	J. A. Dixon	8/22. Hoosier	Note	14		" "	" "
" 8	E.J. Williams	8/20. Grand Royal Range.	Cash	25		June 1-96	Multnomah
" 10	R.J. Rowe	Jumbo 8/22. Rex	"	24		March 96	Peninsular Stove Co.
" "	Wm Rowe	Regt Queen 48/31. Range	"	26 50		Mar 96	C & A. Foundry Co.
" 12	A L Jackman	Regal Rob Roy 8/20. Range	"	29 00		" "	" "

Sales Record of Cook Stoves.

Rotary Nutmeg Grater.

The Specialty Novelty Company, 43 East Marion street, Lancaster, Pa., Allerton-Clarke Company, 97 Chambers street, general agents, have improved their family rotary nutmeg grater as here shown. One of the changes is in the construction of the handle and wire spring, the spring exerting a pressure on the nutmeg, automatically holding it against the grating surface so that all of the nut can be used and yet not allow the two metal parts to come in contact with each other. The grater has been



Family Rotary Nutmeg Grater.

strengthened and stiffened by backing it up with a wheel-like plate of which the handle is a part. The whole utensil is tinned. For export they are handled by C. B. Corwin, 15 Whitehall street, New York.

Programme Advertising.

BY H. C. W.

Will some one kindly suggest a cure for the horrible disease known as "Programme Advertising?" Absolutely the most worthless account that ever entered into a business man's calculations—unprofitable, unpleasing, maker of hard words and hard thoughts. It is more than a problem—it has become a menace—it is held over you as a threat by men you do not care for, more often pressed on you by women you never saw and never will see again, yet who insist that all their trading and their neighbors' trading is done with you. Your answer may be No; they will not take it—"the space costs so little," and they have just this one to fill; the price is invariably three to five times as much as any good newspaper contract you may have, with a valuable circulation of thousands as against any programme's dozen readers You have seen the dummy they carry, laid out in beautiful little blocks and walks and lines of landscape gardening. It is blackmail pure and simple, each little block ranging from $5 to $50—depending on how much they have determined you shall contribute to the festival.

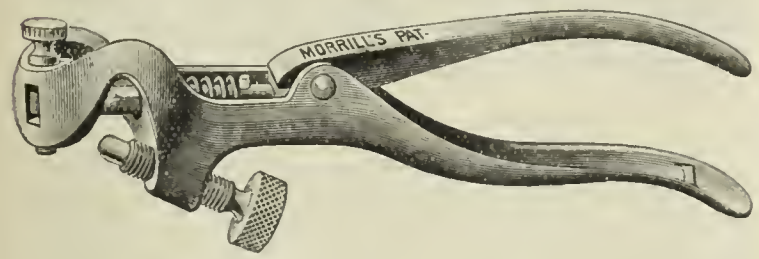
Help us out, somebody—give us some suggestions of value and remedy. They will be on hand in a few days; this is their time for coming, and every day from now on till the welcome spring time will they make their meaning perfectly clear to you in language and terms not to be misunderstood. The daughters of all the known societies are religiously engaged in it, and they gather together and count the results as a miser counts his gold.

With any followers, I will promise to be the first among Hardwaremen to hang a sign within my front doors, reading: "We do no Programme Advertising."—*The Iron Age.*

H. C. Wilhelm has sold out his interest in the Webber Hardware Company, La Porte, Ind., wholesale and retail Hardware, Stoves and Tinware. The firm advise us that they are reducing their line to a first-class retail stock, and will retire from business as soon as they obtain a purchaser for it.

Morrill's New No. 1 Saw Set Perfected.

Charles Morrill, 35 Warren street, New York, is putting on the market the Perfected No. 1 saw set, as here shown. The following directions given for use indicate the special features of its construction: "Hold the saw on any level place, teeth upward. Place the set on the saw. The anvil is movable up and down, so as to



Morrill's New No. 1 Saw Set Perfected.

regulate the distance the operator desires to set his saw teeth down from their points. The knurled screw fastens the anvil in any desired position. The rest screw when moved forward increases the amount of set; moved backward decreases it; by compressing the handles the plunger goes forward, and takes effect on the tooth of saw and presses it into place. Do not set the saw too wide; just enough to clear. It will then work easy, and run straight."

Shepard New Swivel Vise.

The vises shown in the accompanying cuts are put on the market by the Prentiss Vise Company, 44 Barclay

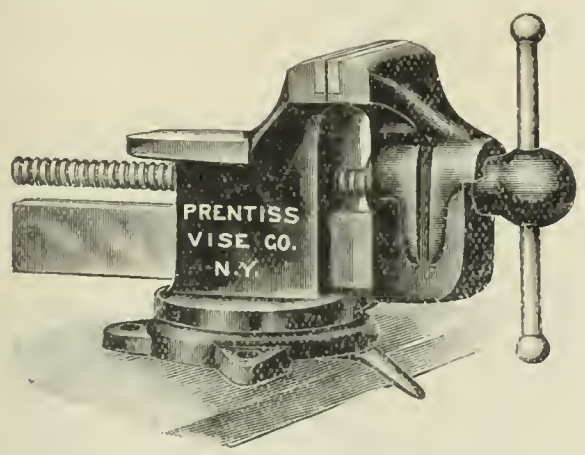


Fig. 1.—Shepard New Swivel Vise.

street, New York. The vises are gotten up as cheap goods, but care is taken in finishing and packing them so as to make them attractive. They have wrought steel

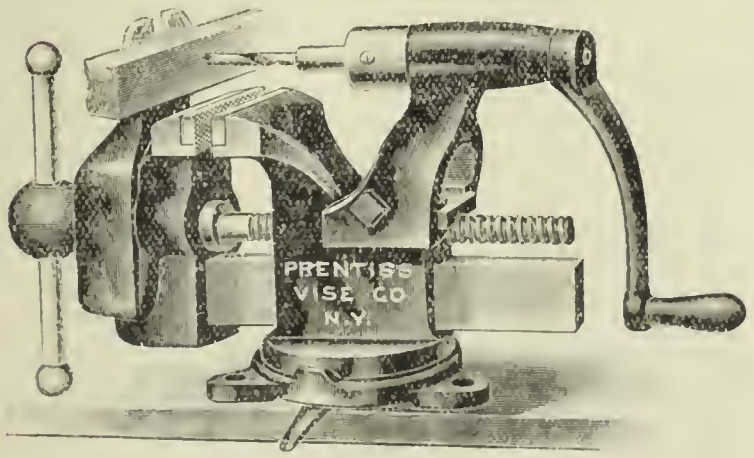
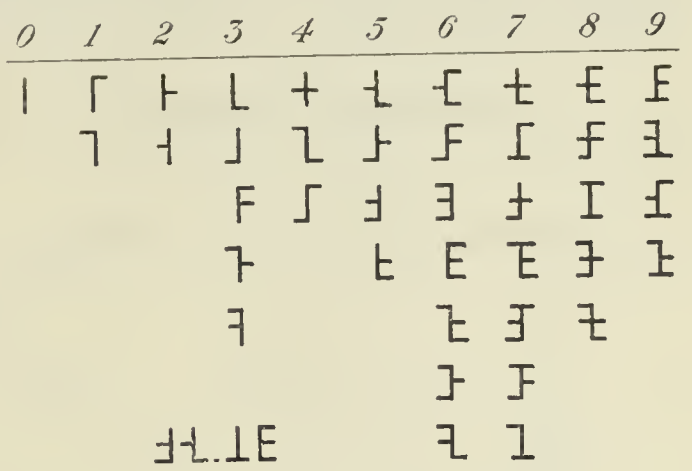


Fig. 2.—Hand Drill Attachments on Shepard Vise.

sliding bars, screws, levers and jaws. The anvils are trued off and polished. One of the features is the swivel bottom, which is all on top of the work bench. By moving the lever a cam is operated and the vise is held in position. In addition to the lever and cam, the periphery of the base is notched, with a tooth or projection on the revolving part of the vise which engages in the notches when the cam is applied. The notches and tooth are not shown in the cut. In Fig. 2 the vise is shown with the Handy drill attachments. The piece against which the work is placed to be drilled is slid down in the grooves, one of which is on each side of the front jaw, which holds it rigidly in place, as shown in Fig. 1. The work is fed to the drill by screwing up the vise. The part of the attachment which carries the drill slides over the anvil and is held firmly in place by tightening the bolt. The bolt has a handled nut, which obviates the use of a wrench in tightening the bolt. Both attachments can be put on or removed in a minute. The drill attachment is made to hold drills with shanks ½ inch in diameter.

A Connecticut Merchant's Suggestion.

The accompanying cost mark, though similar in general appearance to one we published some time since, is entirely different in make up, and is suggested by a Connecticut merchant. The principle upon



A Connecticut Merchant's Suggestion.

which the cost mark is constructed is that the dashes at the top of the perpendicular lines, on either side, count for one; those at the middle, on either side, count for two, while those at the bottom of the perpendicular lines, on either side, count for three. A perpendicular line alone represents 0. The mark at the bottom of the cut is given as an example showing how a cost mark may be written, in which the same figures are repeated while using different signs. The example, it will be seen, reads $55.66. An X or some similar sign can be used for repeat when found necessary.

MEMORANDA.

The Tinners' and Stove Dealers' Association of St. Louis, Mo., was organized Friday evening, November 26, with a membership of 75. G. A. Pauley was chosen president, M. Koch secretary, and H. W. Kratz treasurer.

H. M. Hillson & Co. send out a circular to the trade from Somerville, Mass., announcing that they have opened a salesroom and office at 134 North street, Boston, Mass., where they will keep in stock a full line of Tinware and Kitchen Furnishing Goods.

The 1898 price-list is the thirty-third annual publication of this sort issued by Frank L. Jones, Utica, N. Y. The goods noted in the circular include all sorts of apparatus, supplies and specialties for cheese factories, creameries and dairies. In addition to the price-lists, descriptive particulars are given and a few illustrations where necessary. The circular is printed on green paper and includes 20 pages.

C. E. Wilson, wholesale and retail Hardware, Stoves, Buggies, Wagons, &c., Henderson, N. C., has recently been increasing his facilities, and is now in much better position to handle his growing trade. Mr. Wilson's warehouse is 150 feet long and two stories high.

Reed & Ingvoldstad have succeeded Coombs & Ingvoldstad in the retail Hardware, Stove and Tinware business in Sergeant Bluffs, Iowa.

W. C. Grier, dealer in Hardware, Stoves, Tinware, &c., Milford, Mich., has been succeeded by F. B. Hatch.

Henry Mohr, Hardware merchant of Tacoma, Wash., has taken a prominent part in perfecting an organization of merchants in different lines in that city for the purpose of establishing a company to handle a stock composed exclusively of Klondike goods. A store has been secured, and is being fully stocked with groceries, dry goods, &c. Mr. Mohr will have charge of the Hardware department, including Sleds, Boats, Tents, Stoves, Tools and Cooking

Utensils. The combined stocks will, it is stated, represent a value of nearly $20,000. The outfitting establishment will open in January.

B. B. Stoops has admitted a partner in his Hardware busiuess in Summerville, Mo., and the firm style is now Stoops & Dwoody.

C. H. Heath has retired from the Hardware and plumbing firm of Heath & Byrne Brothers, Santa Cruz, Cal., and the style is now Byrne Brothers. The firm are now also occupying the floor over the store, and are introducing a skylight to secure better light.

Chas. Johnson is successor to Dalton & Gilfillan in the retail Hardware, Stove, Tinware and Agricultural Implement business in Blair, Wis.

George H. Crawford, Cornwall, N. Y., on account of ill health has disposed of his Hardware, Stove, Tinware, tinsmithing and jobbing business to C. H. Elliott, who will continue at the old stand. Mr. Elliott is a practical plumber of 15 years' experience, ten years of which have been spent in New York City.

A Water Purifying Plant.*

BY HOWARD STILLMAN, SACRAMENTO, CAL.

About a year ago the Southern Pacific Railroad Company established at Port Los Angeles, Cal., a plant or adjunct to the pumping statiou for the purpose of purifying the water supply at that point of the large amouut of scaling matter it coutained. The chemical principles involved are based on the well-known Clark or Porter-Clark process.

The mechanical appliance or adjunct to the pumping station was the author's design, and the purpose of this paper is to describe the method as well as the "standardizing" of the process, since the plant referred to was established with a view to rendering the same applicable to other stations ou the company's lines where the waters require purifying. The method which we are to discuss is intended to do away with an elaborate system of works and to furnish a continuous supply of purified water of constant quality without the use of agitators to assist chemical action or the necessity for labor other than that in usual attendance at a water station. It was also desired to do away with expert attention at remote points and avoid the danger of overdosing the supply, or going to the other extreme, with chemical solutions. The treatment of water in the cold on a large scale was considered the cheapest and best method of dealing with it. No two waters from a natural source are just alike, aud the treatment by boiler purges, compounds and nostrums, frequently exploited, is properly of value only in special cases.

The water at Port Los Angeles required a double treatment on account of the bicarbonate of lime contained, together with a large amount of the sulphates of lime and magnesia. The chemical principles involved in the treatment are not new, and it is not the purpose of this paper to discuss them at length, though reference will be made to them later, as well as the special character of the water treated.

DESCRIPTION OF THE APPLIANCE.

The general plan, Fig. 1, shows a sectional elevation and Figs. 5 and 6 a plan of the purifying addition and pumping station. As the system is independent of the action of the pump, except as a constant source of supply, that machine does not necessarily form part of our description. Referring to Fig. 1, the water main *a a* is intercepted in its passage from the pump to supply tanks, Fig. 2, by the circulating tanks Nos. 1 and 2. Detail of construction of these tanks is shown in Fig. 3. They are alike, each about 4½ feet in diameter by 8 feet high, and the space inside is divided up by partial diaphragms, alternately placed, allowing the water in its course to circulate upward, under and over, and check its motion, allowing time for chemical action to take place within them.

Their size is such as to allow the water about five minutes in passing through and the tanks serve virtually as an enlargement of the water main at that point. The arrangement of the diaphragm or baffle plates is not essential to the process, and the circulating tanks are not intended to deposit or dispose of sediment. The water main enters tank No. 1 at the bottom and discharges at the top, thence to bottom of No. 2, again discharging at top, and on to the supply and settling tank, Fig. 2.

Just before entering each of these circulating tanks the water main is tapped by a ½-inch pipe, conveying in a steady stream when in operation a solutiou of desired chemical reagent from the chemical tanks at *b, c*. These chemical tanks are shown in detail at Fig. 4, and the ½-inch feed pipes leading from them, *e, e*, are controlled by the plug cocks *f, f*. These smaller tanks are also of like dimension and hold 100 gallons when charged with solution, which suffices for four hours' continuous operation of the pump, or a supply of about 44,000 gallons of water. As shown in Fig. 4, the tanks are air tight when all cocks are closed, and are filled through the 1¼-inch pipe and screened funnel when the cock *g* is open. The top is tapped by a ¼-inch pipe leading from an air reservoir supplied with compressed air from an 8-inch Westinghouse pump. Just before entering the tanks the small air pipe

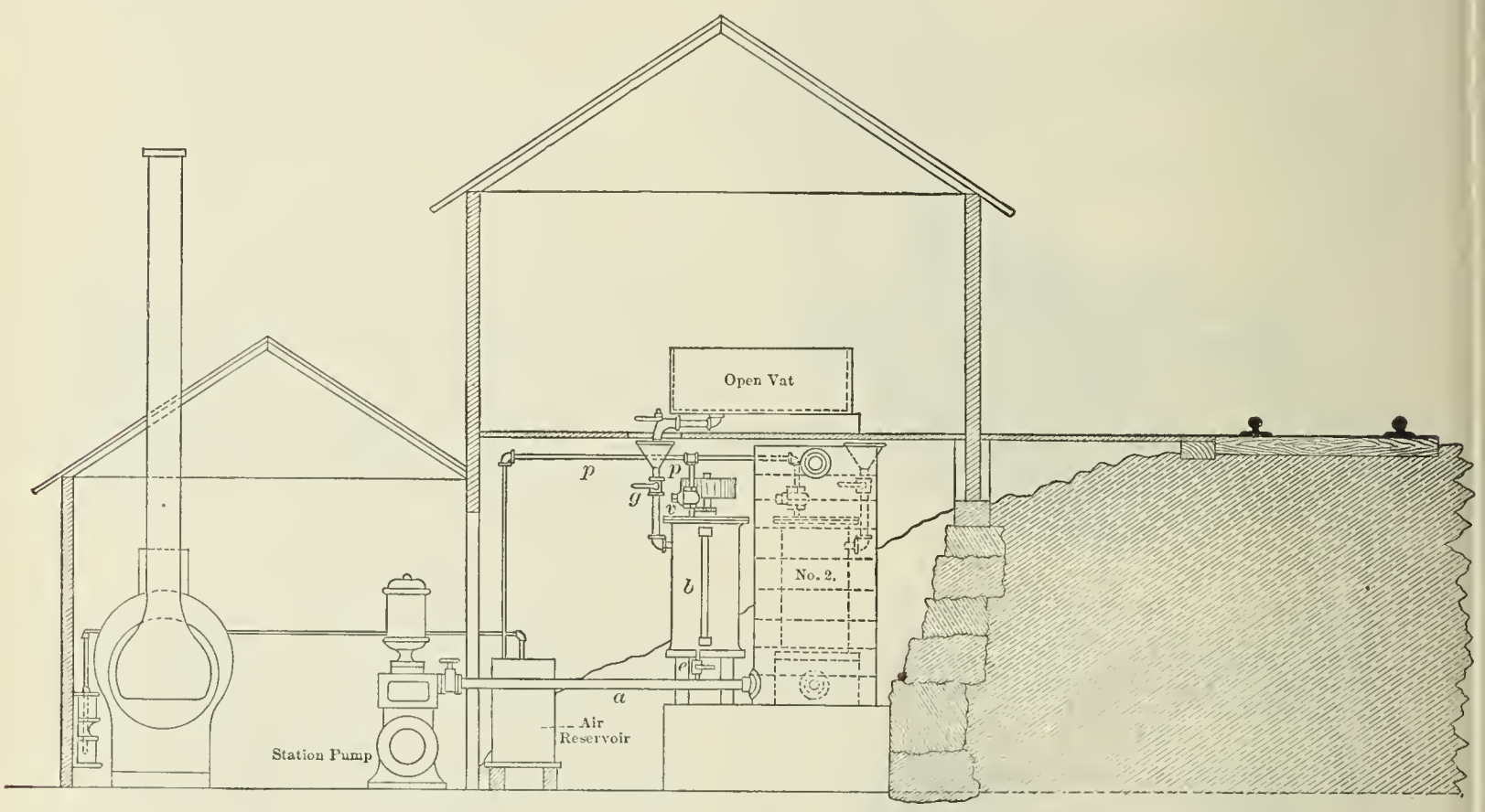


Fig. 1.—Sectional Elevation

A WATER PURIFYING PLANT.

* Paper presented at the New York meeting (December, 1897) of the American Society of Mechanical Engineers.

p is intercepted by a pressure regulating valve, *v*, whereby the air pressure within the chemical tanks is kept at a desired pressure, just overbalancing the hydraulic pressure in the water main aud allowing the solution to flow through the ½ inch feed pipe when the cocks *f* are open. These cocks are always operated wide open to prevent possible clogging up of the pipe by a casual obstruction, and the air pressure is allowed entirely to control the flow of solution to mingle with the water flowing through the circulating tanks to the reservoir. The pressure regulating valves are controlled in the usual manner by wrench and screw at bottom, so that the operator can occasioually adjust the feed of solution. Each chemical tank is about 4 feet high and provided with a long sight feed glass so that the contents can always be noted. They are gauged to feed out 11 inches per hour and when pressures are adjusted do not ordinarily vary. Occasional attention to the pressure valve during pumping hours, such as an engineer gives his sight feed lubricators to steam engine or pump, is sufficient, inasmuch as the hydraulic pressure during pumping hours does not vary more than the head varies in a gravity supply. It has been found that the air pressure on the chemical tanks is about an atmosphere less than hydraulic pressure in the main, so that, as would be expected, the pneumatic actiou is to hold back the solution from flowing out too fast. As referred to above, this

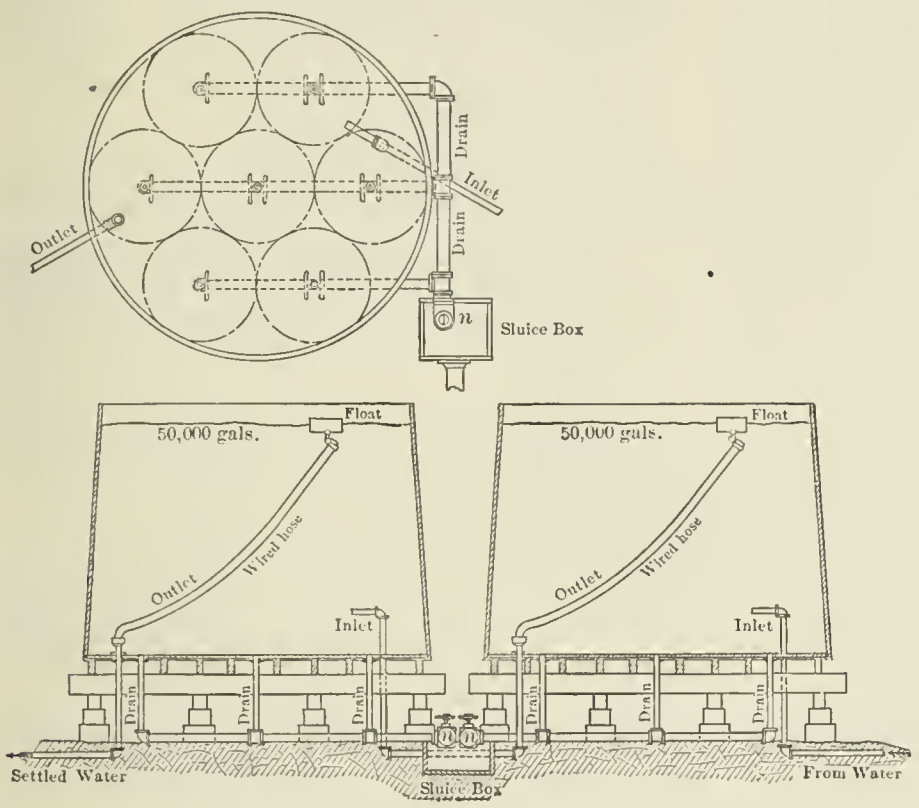


Fig 2.—Arrangement of Water Mains.

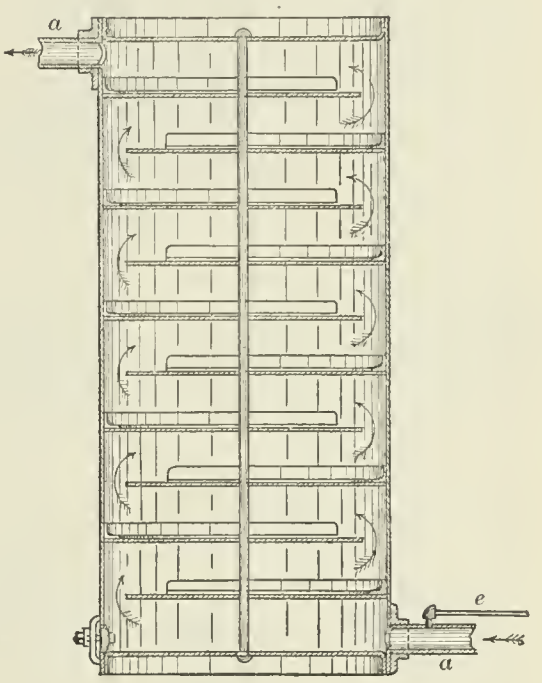


Fig 3.—Tank.

A WATER PURIFYING PLANT.

When slacked and mixed the liquid is a cream of lime, which is run off into the chemical tauk when desired, as before stated.

It requires about five minutes' time to refill the chemical tanks and recharge with air, at which time the water supply or pump is stopped. The tank charged with cream of lime is provided with an upright revolving shaft carrying paddles, as shown in Fig. 4, and worked through a stuffing box in the top by means of a small air motor. The paddles revolve slowly when the tank is feeding into the main, and their purpose serves to stir up the milk of lime to prevent it settling out, and thus deliver a constant amount of lime to the water being treated.

We have just considered the operation of introducing quicklime into the water in proper proportion to effect absorption of carbonic acid and consequent precipitation of carbonates in solution. The roily water now passes on through circulating tauk No. 1, and this part of the desired reaction occurs more or less completely. As referred to before, the water supply at Port Los Angeles contains, besides the carbonates in solution, a large amount of sulphaes. lime and magnesia. These salts not being converted by quicklime require a second reaction. The use of the necessary amount of caustic soda to effect this would have been expensive, besides other objections to its use. Soda ash was good and cheap, but would react with the lime directly to form carbonate of lime if introduced with it ; hence its use necessitated the second chemical tank, with its mixing vat, which is operated by the same method and simultaneously with the lime tank.

In this connection it may be stated that if the cream of lime and carbonate of soda were injected into the supply main from the same chemical tank, or in mixture, a series of chemical reactions would be set up which would theoretically terminate in the desired result, but, as stated, there would be a large amount of chalk formed directly, and there are other reasons why it seemed best to keep the reagents separate and make of it a double continuous process.

The soda tank is like Fig. 4, except that it requires no stirring device, as the solution is some distance from saturation and does not settle out. The weight of soda ash put into the soda mixing vat is dependent on same data as before. The amount required to convert the sulphates being 2 2 10 pounds per 1000 gallons, we have 4 × 11 × 2 2-10, or 96 pounds, to be dissolved in water to 12 inches in depth in the mixing vat. The lime is prepared by placing the stated weight of a good commercial article, fresh burned preferred, in the vat and letting in from an adjacent hydrant enough water to slack, after which more water is added to the required 12-inch depth. The soda is prepared in its vat in the same manner, except that it is simply a matter of solution, which is quite strong yet not saturated, hence no separation or crystallization of sal soda occurs in the chemical tank.

As the water in the main receives its second injection

feed could have been regulated from the cock *e*, or the pipe made smaller, but it was desired that at no time should the operation "hang fire" by clogging of a small opening. When the pumping ceases the cocks *e* in feed pipes are immediately closed, and when again pumping is renewed the cocks are opened. At Port Los Angeles the hydraulic pressure is about 92 pounds gauge and the discharge of the pump a little over 11,000 gallons an hour.

CHEMICAL TANKS.

The chemical tanks are filled as required from the mixing vats on the floor directly overhead, which is on a level with the track, as shown in Fig. 1. These vats are open and have 1¼-inch pipe connection at bottom, terminating iu plug cocks opening downward through holes in the floor directly into the screened chemical tank funnels, for convenience in filling. The vats are rectangular in form and of such size that a 12-inch depth of liquid fills a chemical tank for four hours' continuous run of pump. The weight of chemical material per 12-inch depth of liquid in the open vat gives a standard solution and is based on the quality of the water and its hourly rate of flow through the main to the reservoir, which data give the key to the situation, as, for instance, supposing analysis and tests of the water show that it will require 1 64-100 pounds of mslacked lime to absorb the carbonic acid in 1000 gallons. The flow through the main being 11,000 gallons per hour and the charge to last four hours, then we have 4 × 11 × 1 64-100, or 72 pounds, of lime to be slacked with water to a depth of 12 inches, 100 gallons, in the mixing vat.

from the soda tank, it passes on through the circulating tank No. 2, where the carbonate of soda effects its reaction more or less completely, and thence on to the storage and settling tanks, which are large enough to contain at least 24 hours' supply. The treated water is milky with precipitated carbonates, and discharges through the inlet pipe about 4 feet from the tank bottom. The outlet to this tank is a piece of 4-inch wired hose, the open end of which attaches to a float on the surface, as shown in Fig. 2. By this means the clearest water in this tank passes on to the second similar tank by the same method. Clear water is always obtained from the surface outlet of the second tank.

The chalk deposit is considerable at the bottom of the settling tanks and has to be drawn off occasionally, which is effected by the "spider drain" system shown in Fig. 2, which consists in tapping the tank bottom with seven 4-inch drain pipes. The location of these drains is shown

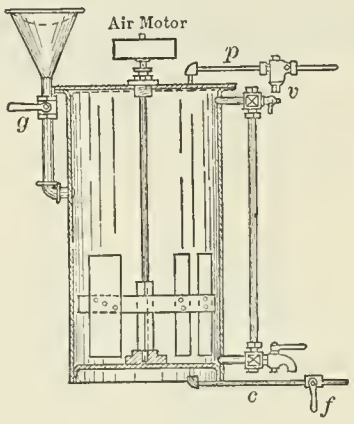


Fig. 4—Chemical Tank.

supply coming from the tank furthest from the water station. This, however, is a matter of circumstance and expense, dependent on local conditions.

RESULTS.

The following analyses are shown of the Port Los Angeles water supply in tabulated form "before" and "after" treatment. The analysis "before" is one of several which were made at intervals during a year previous to putting in the treating system. None of these analyses varied materially with the season. The analysis "after" was made about two months after the system went into operation, and is also one of several made during the past year without showing material variation in the treated supply.

Source of Supply, Well in Bed of Santa Monica Cañon, about 100 Yards from Pacific Ocean Beach.

Treatment per 1,000 Gallons. Contained in the water in solution in grains per U. S. gallon:	Date of Analysis. Before. March, 1896.	After. December, 1896. Lime, $1\frac{64}{100}$ pounds. Soda ash, $2\frac{2}{10}$ pounds.
Carbonate lime	14.29	0.69
Sulphate lime	5.07	0.29
Carbonate magnesia	1.22	7.15
Sulphate magnesia	17.15	1.63
Silica	1.34	0.11
Alumina	0.17	0.17
Sulphate soda	3.56	27.92
Chloride soda	8.75	5.71
Total	51.55	43.67
Incrustating matter	39.24	10.04
Non-incrustating matter	12.31	33.63

Cost per 1,000 gallons to treat, 4 cents.

The above analyses are presented as showing in a commercial way the result of the treatment. The treated

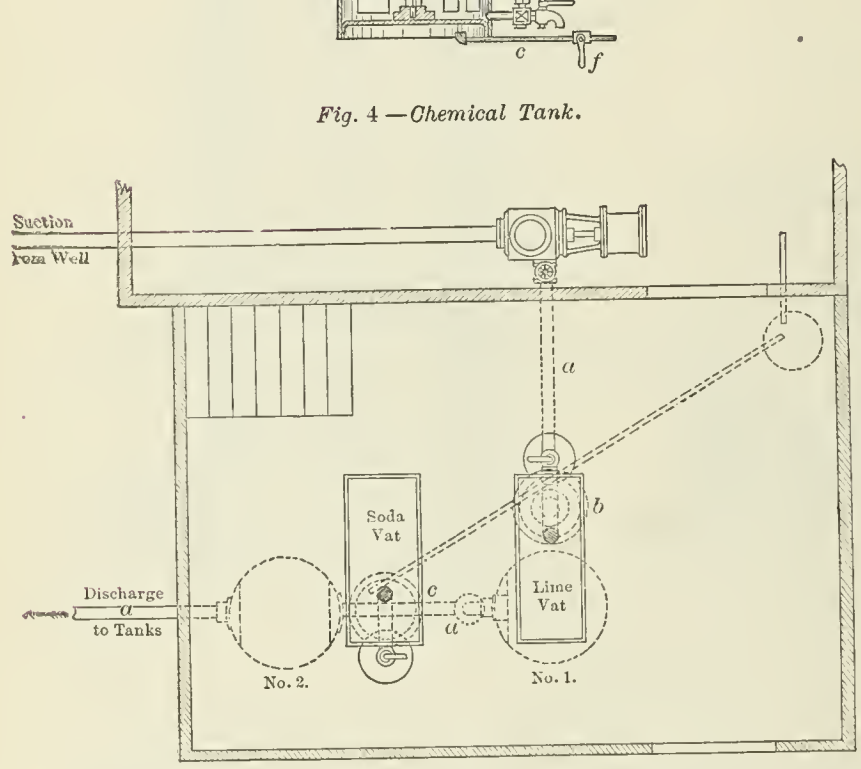


Fig 5.

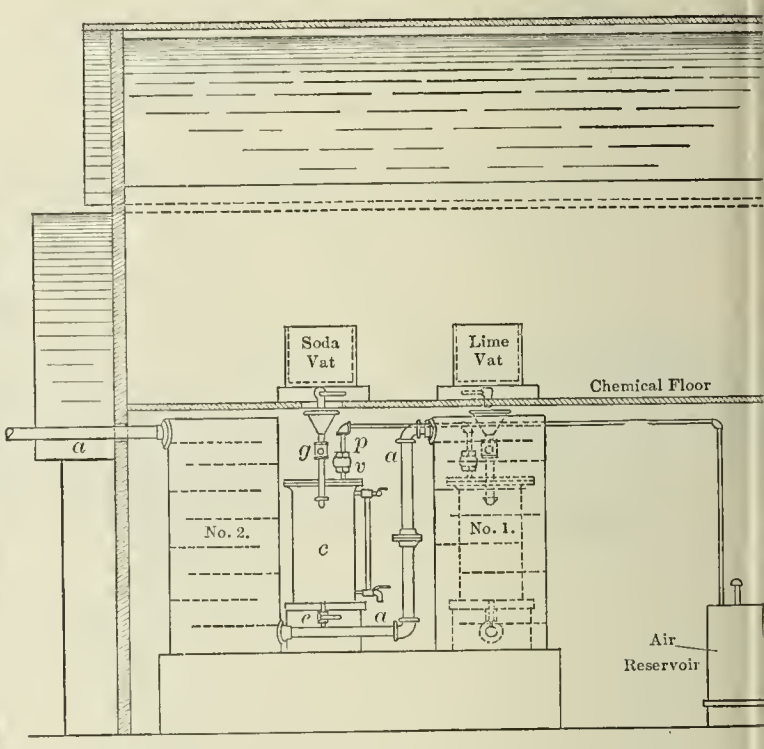


Fig. 6.

Views Showing Tank Arrangement

A WATER PURIFYING PLANT.

in the plan of one of the tanks, Fig. 2, the drainage areas being indicated by the tangent dotted circles.

The vertical 4-inch drain pipes open into larger horizontal pipes, and these into a 9-inch pipe at right angles, terminating in the sludge valve shown at *n*, Fig. 2. This valve discharges downward into the sluice box, and when opened the tank bottom is drained from seven equi-distant openings, which keeps the chalk deposit down near the tank bottom and prevents the "angle of slope" which the deposit would assume with but a single central discharge, whereby the deposit would accumulate up along the sides of the tank to interfere with clear settling, and would also require an occasional scraping or shoveling out. Each of the tanks is provided, independently, with this spider drain arrangement, though both sludge valves discharge into the same sluice box.

While for practical purposes it has been determined that sufficient tankage for a day's supply is ample to insure settled water, the system can be used by putting up a number of smaller tanks with less total capacity than a day's supply, provided the surface water from each tank drains to the lower part of the next and so on, the final sample was taken from the supply pipe at the end of the company's wharf, about 1¼ miles from the settling tanks, which are placed on top of a bluff across the cañon and about 160 feet above the track.

Returning to a discussion of the treated analysis: There is shown to be 7.15 grains per gallon carbonate of magnesia remaining in solution. Its presence seems due to the fact that the well water contained more carbonic acid than allowed for as in combination with carbonate of lime, hence the carbonate of soda in its reaction with the sulphate of magnesia produced in part the soluble bicarbonate of magnesia. It was found subsequently that an increase in amount of quicklime from 1 64-100 to 2 pounds per 1000 gallons reduced the carbonate of magnesia to about 3 grains per gallon, without an excess of lime showing in the treated water.

The analysis shows almost 28 grains of the neutral sulphate of soda. This alkali is not desirable, as having a tendency to produce foaming if allowed to become too concentrated in the boiler, but is neutral in other ways as affecting water for boiler use. Its presence is unavoidable, as being the direct product of soda ash and magnesia

sulphate, $Na_2CO_3 + MgSO_4 = MgCO_3 + Na_2SO_4$. The greater portion of the $MgCO_3$ is precipitated, but the soluble Na_2SO_4 necessarily remains, and like other alkali salts can only be removed from a water by evaporation.

While the treated water is not shown to be "purified" in the proper sense of the term, yet it is converted to a fairly good water for boiler use. Previous to treatment the water formed a large amount of very hard scale, with considerable corrosion. I have seen pieces of this scale 1½ inches thick and weighing over a pound, which could be best pulverized on an anvil. Analysis of this scale showed it to contain very much more of the hardening element, sulphate of lime, than was due to the amount of that element existing in the water before use; hence it seemed most probable that superheating of fire box plates to force heat through the intervening scale to make steam led to decomposition of the sulphate of magnesia, forming, with the carbonate of lime, more sulphate of lime and carbonate of magnesia. The superheating of the plates from the cause stated would possibly lead to decomposition of a film of water next to them and account for the corrosion, as oxidation under these circumstances would seem bound to occur ultimately.

A switch engine with clean boiler was put to work on the wharf at Port Los Angeles, using only treated water, not long after the plant was put in operation, and observations made at intervals on the action of the water. No scale forms from its use, but a small deposit of magnesia sludge, having no tendency to form scale, has at times been observed. Otherwise the treatment has greatly improved the quality of the supply.

TRADE NOTES.

The Standard Aluminum Reduction Company of St. Louis, Mo., have been incorporated under the laws of West Virginia, with a capital stock, registered in St. Louis, of $20,000.

W. I. Jones & Co., manufacturers of Tin Cans, are about to move their business from Roanoke, Va., to Wilmington, N. C.

David Morrison's Brass Works, 55 West Sixteenth street, New York, were damaged by fire on December 6. The loss is reported to be fully covered by insurance.

The Old Meadow Rolling Mill Company of Scottdale, Pa., were incorporated at Harrisburg, Pa., on December 6, to manufacture Sheet Iron and Steel, with a capital of $125,000. The directors are H. F. McCann, James A. Bennett, Greensburg; John W. Ruth, John S. Parker, M. A. McCoombs, A. C. Overholt, A. L. Keister, Scottdale.

The Sleeper Machine Company, 35 Congress street, Boston, Mass., manufacturers of Can Making Machinery, issue an illustrated folder describing their special Lock Seaming Machine and their Lock Seaming and Soldering Combination Machine. The first named device is peculiarly adapted for the manufacture of all cans where no soldering is desired, and is capable of seaming 40 to 60 can bodies per minute according to the size of the can. The capacity of the Combination Machine is 35 can bodies a minute. The company make also Lap Seamers, Heading Machines and Rolling Mills.

It is reported that the sheet mills of the Corning Steel Company, at Hammond, Ind., are being repaired and put in readiness to resume operations. They were last operated under lease by the Illinois Steel Company.

The reported fire loss on the Elmira Brass & Iron Works of I. B. Coleman, Elmira, N. Y., was greatly exaggerated, and was fully covered by insurance. We learn officially that the foundry was not injured, that the proprietor has moved into a more commodious shop and is in better shape for buisness. Full time with full force is expected to be made about as we go to press.

The Dallas *News* reports that arrangements have been made for the manufacture of Metal Tanks at Corsicana, Texas.

The Enterprise Enameling Company are erecting a new plant at Bellaire, Ohio. It will be located on the site formerly occupied by the Enterprise Glass Company.

Arrangements have been perfected for a novel exhibit at the Trans-Mississippi Exposition, at Omaha, Neb., next spring. The citizens of the State of Kansas propose to collect all the mortgages canceled in that State during the past year and forward them to Omaha, to be placed in display in one huge pile as an evidence of the fact that Kansas is practically free from debt. It is calculated that the canceled Kansas mortgages will probably fill a freight car.

Photographs Without Light.

In a recent paper read by Dr. Russell before the Royal Society he described the results of a series of experiments which, to photographers, almost rival the discovery of the X-rays. From time to time, says the "Journal" of the Franklin Institute, various experimenters have claimed to obtain photographs by the long exposnre of bodies to sensitive photographic surfaces withont the action of light. As far as we are aware, however, with the exception of Becquerel's and Colson's experiments, the precautions taken for the exclusion of extraneous light have not been such as to place these experiments above suspicion.

There now seems little room for doubt that many of the common substances with which we are surrounded have the property of emitting invisible active radiations, which can pass through many bodies that we have been in the habit of regarding as opaque. Becquerel some time ago showed that different compounds of uranium, if allowed to remain on a sensitive photographic plate for some days in the dark, had considerable action on the film, and if the plate was developed in the usual way a photograph of the body was obtained.

Dr. Russell, in repeating Becquerel's experiments, has discovered that this particular action is by no means confined to uranium salts, but that many of the metals and other bodies, such as wood, charcoal, copal, straw, &c., possess it in a marked degree. The radiations from these bodies, however, differ in one very important particular from those given out by the uranium compounds. While the latter readily pass through glass, the former are completely stopped by it. Mr. Colson, in January last, described the action of zinc, cadmium and magnesium on photographic films in the dark. At the time of making his experiments Dr. Russell was not aware of this, and consequently his results are independently confirmed.

Starting with the metals, mercury, zinc, magnesium, cadmium, nickel, aluminum, pewter, fusible metal, lead, bismuth, tin, cobalt and antimony, he found that all these, after a week's exposure near a sensitive plate in the dark, produced a distinct effect upon the plate, while gold, iron and copper only showed a very slight effect. The action is not in any way due to "contact phenomena," as a polished surface of zinc with a design scratched on it gave a distinct image of the markings when not touching the plate, and even when thin screens of gutta percha or celluloid were interposed between the sensitive plate and the zinc surface. Some metals were then coated with copal varnish, to see if this would interfere with the effect. It was found that the image was more rather than less distinct.

In another set of experiments, cardboard pill boxes were used for inclosing certain substances before allowing them to act upon the photographic plate. It was discovered that an empty box emitted active radiations, giving a most distinct image. This suggested experiments with different cardboards, when it was found that the better qualities were quite inactive, while the common varieties, known as straw board, had considerable action on the plates. Among the other bodies experimented with were green and dry woods, both of which were active. A section from a young larch tree gave an excellent image, showing rings and layer of bark. Charcoal was also found to be active, but lost its activity if heated for several hours in a closed crucible.

The results obtained with printers' ink were very interesting. In many cases they prodnced no action at all, and in other cases they were remarkably active. The ink used by the *Westminster Gazette*, the *Standard* and the *Daily Graphic* gave excellent pictures of the printing. The *Times* showed not quite such good results, while ink of the *Morning Post* and the *Eeho* had no action at all.

What is this mysterious force? Its nature has still to be discovered. Two points seem to have been established. The first is that an increase of the temperature of the body greatly increases its activity; the second, that aqueous vapor in no way assists the action. Bodies which at 0 degree C. had no action whatever, at 70 degrees C. gave distinct images. It has further been suggested that the chemical action is caused by a finely attenuated vapor given out by the different metals and other bodies. It is far more likely to be due to some hidden form of energy more or less akin to what has been paradoxically, but suggestively, called dark light.

Factory Inspector Campbell of Pennsylvania estimates that there are 150,000 more people at work in the factories of that State now than were employed in them a year ago.

A dispatch from Cripple Creek, Col., reports that the northern boundary of the Cripple Creek gold district has been extended three miles by the discovery on Copper Mountain of a large blanket vein of ore running from $10 to $1500 per ton in gold. The gold is said to lie quite near the surface.

STOVE TRADE NOTES.

John M. Graff.

The stove trade has lost another of its veteran members by the death of John Milton Graff of the firm of Graff & Co., 208 Water street, New York City, which occurred at his home, 118 St. James place, Brooklyn, N. Y., on Saturday, December 4. The immediate cause of his death was Bright's disease, complicated with heart trouble. Some two years ago Mr. Graff had a serious illness from which he never seemed to fully recover, and for more than a year he has been able to give only irregular attention to his business affairs. He was born in Spencertown, N. Y., December 21, 1835, where he spent his early manhood. It was also here that he learned the trade of tinsmith and stovemaking and engaged in the retail business under the firm name of Graff & Rossman. He left Hudson about 1870 and went to Troy, where he engaged in the manufacture of stoves with two associates, under the style of Shavor, Henderson & Graff. It was while a member of this firm that they brought out the Lively Times parlor stoves, with which the older members of the trade are, doubtless, familiar. Mr. Graff, however, continued in Troy for only a short time, when he came to New York and was admitted as a partner to the firm of Burtis & Rice, which then became Burtis, Graff & Rice. These associations were maintained for a few years until Mr. Rice retired, when the business was conducted under the firm name of Burtis & Graff. This arrangement continued until 1876 or 1877, when, owing to the general condition of business, the firm became financially embarrassed and Mr. Burtis retired from the field. Upon what may be said to have been the ruins of that business, Mr. Graff, in 1878, associated with him W. M. Seymour, and they started operations under the style of Graff & Co. Mr. Graff, whose portrait we present herewith, was of a rather retiring disposition, but was held in high esteem by all with whom he came in contact, either in a social or business way. He leaves a widow, a son and two daughters.

JOHN M. GRAFF.

In announcing the death of Mr. Graff the company state that the business will be continued without any interruption and under the same name by the surviving partners, William M. Seymour and John H. Forshew, together with the Estate of John M. Graff.

Solomon S. Detwiler.

In the death of Solomon S. Detwiler, which occurred in New York City on Sunday, December 5, Columbia, Pa., has lost an honored citizen and the Keeley Stove Company a valuable officer. For some time past Mr. Detwiler had been in poor health, and it was with a view to improving his condition that a little more than a month ago, accompanied by his family, he came to New York for medical treatment. The hoped for improvement and relief, however, were not realized, and he gradually became weaker until Sunday forenoon, when he gradually passed away.

Mr. Detwiler, the youngest son of Joseph and Susannah Detwiler, was born in the old homestead just west of Wrightsville, on October 28, 1833. He spent his boyhood on the farm and was educated in the local country schoolhouse and in Mount Joy Academy. He then removed to Columbia, entering the hardware store of Jonas Rumple, where he continued until July 3, 1860, when, with his brother, Daniel H., he engaged in a private banking business under the style of Detwiler & Brother. In the same year he purchased the property at the corner of Second and Locust streets, establishing the banking business in the room in which the First National Bank is now located, and occupying the dwelling portion of the building as a home, having been married that year to Miss Mary C. Redsecker. The firm continued in the banking business until 1864, when they were succeeded by the First National Bank, which was organized with a capital stock of $100,000, Mr. Detwiler becoming cashier, a position he filled uninterruptedly for more than 33 years. During this time he engaged in numerous enterprises, and in the last 20 years especially took a prominent part in the rapid growth of Columbia and its industrial development. He helped to organize, manage and direct the Keeley Stove Company, of which at the time of his death he was the president and a director; he promoted the organization of the Columbia Iron Company, was foremost in securing for Columbia the lace and silk mills, and contributed largely to the securing and organization of the Grey Iron Company, being one of their directors. Another result of his work was the East Columbia Land Company and the beautiful suburb which they created, his last enterprise being the Columbia Banking Company, of which he was director and treasurer.

Mr. Detwiler was a man of great energy and ceaseless activity, and his interests extended over a wide range. He manifested great interest in municipal affairs, serving in the Borough Council for six years, and was its president in 1872-3. He was a member of the committees which erected the Market House in 1868 and the Opera House in 1873. He was also interested in the electric railway system, was prominent in the negotiations which ended in retaining the Pennsylvania Railroad Company's roundhouse at Columbia, and helped to promote the removal of the brush factory to East Columbia.

Mr. Detwiler's body was taken to Columbia Monday evening, and the funeral services were held at 2 p.m. on Thursday afternoon. In an announcement of the death of Mr. Detwiler, signed by W. D. Snyder, general manager, and J. E. Shomier, secretary of the Keeley Stove Company, is found the following paragraph:

The success of this company was largely due to his tireless efforts and remarkable energies. Its present pros-

perous condition is the best testimonial we can offer to his personal and official devotion to its interests. While yet in love with life, and raptured with the world, he passed to silence and pathetic dust. Brave and tender, in every storm of life he was oak and rock; bnt in sunshine he was vine and bloom. He sided with the weak, the poor and the wronged. With loyal heart and with honest hands he faithfully discharged all public trusts. He added to the sum of human joy, and were every one for whom he did some loving service to bring a blossm to his grave, he would sleep to-night beneath a wilderness of flowers.

Eighty-sixth Birthday of James S. Lithgow.

The stove trade of the country numbers among its members many veterans, but it is probable that there are few older than James S. Lithgow, once Mayor of Louisville, and one of her most respected citizens, who celebrated his eighty-sixth birthday on Monday, November 29. While there were no special ceremonies at his home, many of his old friends called to pay their respects and congratulate him upon his long life and good health. Mr. Lithgow was born in Pittsburgh in 1812, and went to Louisville December 13, 1832, where he has since resided, having held numerous public offices and positions of trust in religious and financial circles. He has always taken an active interest in politics, but has never been a seeker for public office. He has been called upon time and again to serve in both boards of the General Council at different times, and was Mayor of Louisville in 1866 and 1867, but. as he recently expressed it, he always got out as soon as he could. When Mr. Lithgow first went to Louisville he worked as a journeyman, having learned his trade between 1826 and the time of his going to that city. In August, 1836, he was called home by the death of his mother. He had no brothers or sisters, and his father had died when he was but nine months old. He was planning with a shopmate a trip around the world, and proposed starting at an early date. While they were discussing their plans one day, and figuring how they could make both ends meet, see the world and at the same time make a living, a man came to him and said that a friend wanted to see him over on Main street. He went and was confronted with a statement that it was his desire that he should go into partnership with a young man named Wallace, but Mr. Lithgow said that he had no money and that such a thing was entirely out of the question. Nevertheless he signed a co-partnership agreement with Mr. Wallace, and that afternoon they began to look for a suitable location. They found a new store on Market street, just east of Third street, and while Mr. Wallace looked after the purchase of tools and necessary machinery, Mr. Lithgow looked after the store, and on December 3 the new firm were doing business, and they were successful from the start. In 1843 they started a foundry on Water street, between Second and Third, for the manufacture of stoves. They turned out the first coal stoves that ever were made in that city, and subsequently built two warehouses on Second street. The periodic rises of the river caused considerable inconvenience, and in 1856 the firm built their present foundry at Hancock and Main streets. Mr. Wallace died in 1861, and in 1874 Mr. Lithgow formed a corporation under the style of Jas. S. Lithgow & Co., taking in his sons-in-law, Mr. Smyser and Mr. Smith, and others. This company have always held a prominent position. Mr. Lithgow seldom fails to go to the office every day, and continues a general supervision of the immense plant. Mr. Lithgow has five daughters living and has more than 20 grandchildren. His wife died in 1891.

Good Trade in Chicago.—The Chicago stove houses report a surprisingly good demand for December. It had been expected that business would practically cease with the advent of the closing month of the year. This had been the experience of previous years, but 1897 maintains its perversity to the end, and sales are made when dullness is expected, just as earlier in the season it was dull when there should have been a brisk demand. However, nobody is complaining of this new turn of affairs, and it is to be presumed that nobody will complain even if he is too busy to go out to select Christmas presents for his family and friends.

The trade will be interested in learning that F. Pickering of Sandusky, Ohio, who has traveled for many of the leading foundries of the country during the past 25 years, will during 1898 cover Western and Northern Ohio and Indiana in the interests of the Bellaire Stove Company of Bellaire, Ohio. E. R. Reed will continue to call upon the trade in his usual territory in the interests of this concern, while R. C. Montgomery will look after their business in Eastern Ohio and Western Pennsylvania.

ODD PLATES.

The Champion Steel Range Company of Cleveland, Ohio, report a good demand for their Marquart Steel Range, and say that the sales of it are 50 per cent. larger than last season.

Col. Isaac D. Smead, formerly president and superintendent of the Smead Furnace & Foundry Company, at Toledo, Ohio, has severed his connection with that concern. We understand that this step has been taken in order that he may give his entire attention to the business of a recently organized company who will manufacture Garbage Crematories under his patents. The business of the Smead Furnace & Foundry Company will be continued under the general snpervision of Mr. Dowd.

We have received from Schellhammer & Sons, Warren, Pa., a circular of their Pennsylvania Gas Furnace which gives half-tone engravings of a church and a residence which are heated by their Gas Furnace. In one instance it is stated that a residence of 12 rooms and a hall is heated with gas at an expense of but $8 a month in the coldest weather and a less expenditure in the milder months. The Furnaces, made in different sizes and prices, are shown in the circular.

The California Stove & Iron Works of Oakland, Cal. which were incorporated two years ago last August, have been meeting with a good demand for their products, and the growth of the business has been such that it has been found necessary to enlarge their plant. For nearly a month past operations have been going on night and day on orders from Honolulu and other points. Their well-known California Range is in good demand, and was awarded a gold medal in the exhibitions of 1895-96 and 1897. Several hundred of their ranges are in use in Oakland, Berkeley and Alameda, and the company are at work on some new Stoves, which will probably be put on the market within the next 30 days.

Articles of incorporation were filed with the Secretary of State of Kentucky on Friday, November 26, by Bridgeford & Co. of Louisville, the articles being filed by C. W. Adams, C. H. Shields and A. L. Adams. The capital stock is fixed at $75,000, with the privilege of increasing to $150,000, and the indebtedness to which the corporation may subject itself is $20,000. The incorporators named above are to constitute the first Board of Directors.

Isaac A. Sheppard & Co., Philadelphia, Pa., put Eclipse Covers on their Excelsior Ranges. It gives the dealer a good, strong "talking point," one that the housewife grasps at the outstart. The Eclipse Cover, which is the kind that lifts at the center of gravity, is supplied free with the Excelsior Ranges.

George H. Barbour of the Michigan Stove Company, Detroit, is the subject of some pleasant remarks in the Sunday issue of one of the local papers, the article being accompanied by an excellent likeness of this well-known Stove man. Mr. Barbour is prominent in local affairs both in a business way and socially, and is highly regarded by all who know him.

Buck's Stove & Range Company, St. Louis, advise us that upon the recommendation of a committee of special judges, and with the approval of the Committee of Award they have been awarded a diploma of excellence, with silver medal, for the most complete display of Steel Ranges at the Tennessee Centennial Exposition, which was recently held in Nashville, Tenn. The display consisted almost entirely of Steel Ranges, and the award of merit is particularly gratifying to the Buck's Stove & Range Company in view of the number of manufactnrers who made displays of a similar character. This company commenced the manufacture of Steel Ranges some four years since, and were one of the first stove foundries to engage in the manufacture of this line of goods. Anticipating that their action in this direction would be followed by other stove manufacturers, they determined to confine their ontput to a strictly high grade line of Steel Ranges, believing that the production of a low priced Range meant a cheap range both as to material and construction, and a consequent reflection on them as manufacturers of high grade goods. They have steadily adhered to this plan, and are to-day manufacturing a full and complete line of high grade Ranges, which, they advise us, are placed on the market at a moderate price.

The Somerset Stove Company, Somerset, Mass., of whom W. P. Hood is treasurer and manager, have issued a very pretty decorated poster calling attention to their new famous Somerset Pallas Range and Parlor Stoves for 1898. The Range is of attractive exterior, substantial in appearance, and is provided with the modern improvements. Among these features may be noted extra large oven, deep fire box, patent oven door opener, sheet iron ash pan with cast iron frame, large broiler door, double oven top and a drop door in the oven door; in other words, the name plate consists of a panel which can be

dropped in order to examine the contents of the oven. One of the features which will command the attention of the housewife is a thermometer in the name plate on the oven door, by means of which the temperature of the oven may be seen at a glance. The parlor heater is of the surface burning type, with cylindrical body, reversible flues, and other features essential to powerful heating.

The Detroit Furnace & Heater Company of Detroit, Mich., are now located in their new plant, the machinery having been started on December 1. The new plant is about three times the size of the old one, and no pains or expense has been spared to make it complete as regards equipment in every particular.

R. L. Morley, associate manager of the Michigan Stove Company, Chicago, has been called to his old home in England on a mournful errand. His father died recently, leaving his mother without any immediate relatives near her. Mr. Morley therefore determined to bring her to America. He left Chicago November 29, and expects to return January 2.

The Estate of P. D. Beckwith, Dowagiac, Mich., is going into the Furnace business quite extensively, but the report is incorrect that it proposes to bring out a Boiler for steam and hot water heating. This rumor doubtless arose from the fact that the estate has made a hot water attachment to go into the different sizes of furnaces, to be used where people wish hot air and water heating from the same Furnace. This is especially adapted to cases in which there is a room which from its location may be difficult to heat with warm air. Manager Fred. E. Lee says his Furnace trade this year has been extremely successful, and he feels that he has a Furnace in every respect worthy the name Round Oak. Another season its sales are to be pushed as hard as possible. Mr. Lee further reports a fine trade this year on Round Oak Stoves and Ranges and believes that trade will continue to improve.

Geo. M. Clark & Co., 72 to 76 Lake street, Chicago, have under way at their factory, at Harvey, Ill., a new oil and water gas plant for lighting and heating purposes, as well as for use in testing stoves, soldering, brazing, and other operations requiring or permitting of gas for fuel. The gas may also be used in the japanning ovens. The plant is to be in operation by the beginning of January.

The Bliss Dial Feed Presses.

The engravings here presented illustrate two new dial feed presses, built by the E. W. Bliss Company, 16 Adams street, Brooklyn. They are intended for the rapid production of brass goods, lamp burners, watch and clock case stampings, oil cups and similar goods. The straight sided machine, Fig. 1, is for much heavier work than the other. The slide of this press may be arranged to carry one, two or three punches, according to the nature of the work, so that a boy or girl can accomplish from 80 to 250 operations per minute by simply dropping the blank or shell to be reshaped, pierced or stamped into the holes of the dial as it moves along. The value of this great speed of production and facility of handling is enhanced by the entire absence of risk to the operator, who has no occasion whatever to put his hands between the punches and dies. The safety device shown at the right is so connected with the clutch as to stop the slide on its downward stroke before it can do any harm in case some accident should prevent the dial from assuming its correct position. The cam next to the frame actuates, by means of lever connections not visible in the cut, a knockout which pushes the articles out of the dies back into the dial holes to receive a second or third operation as they move along. As shown in the cut, the press is arranged for the second and third operations on watch case covers, as indicated in Fig. 3. The weight of the press complete is about 5000 pounds.

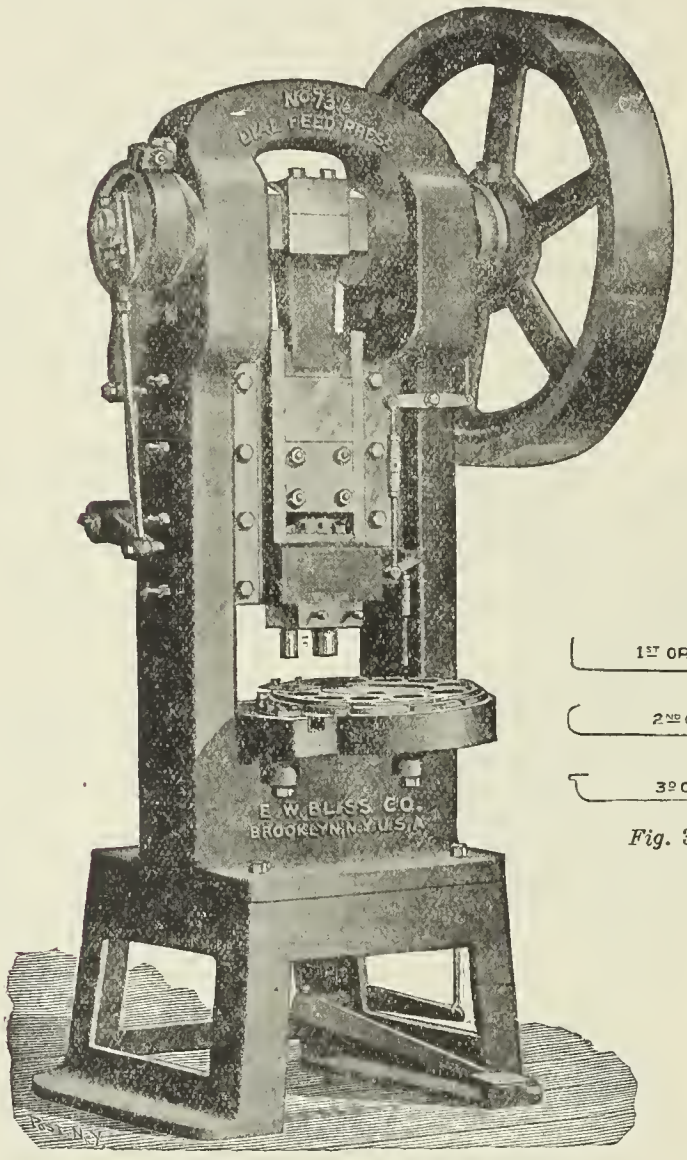


Fig. 1.

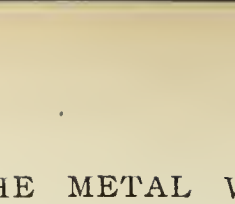


Fig. 3.

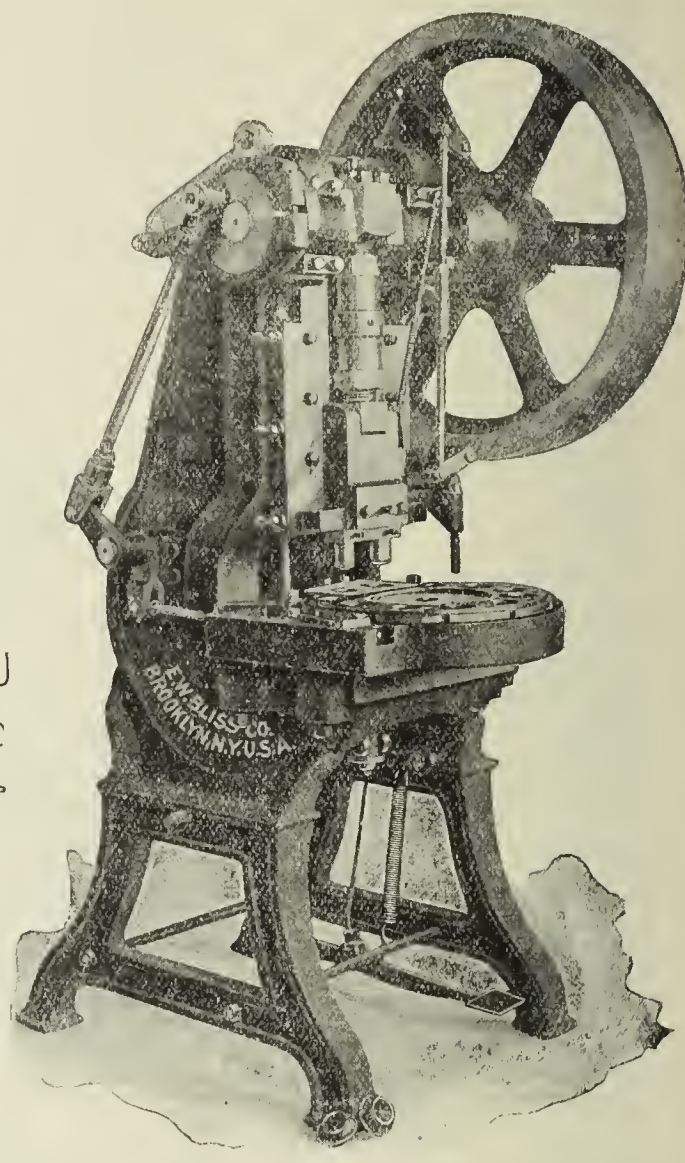


Fig. 2

THE BLISS DIAL FEED PRESSES

The press in Fig. 2 is identical with that in Fig. 1, so far as the dial feed and the mechanism for operating it go, but on account of its lighter and overhanging frame it is better adapted for work not requiring so great a pressure. The weight of this machine is about 2600 pounds, but feed attachments similar to those illustrated are also fitted to lighter presses.

Canadian News.

Ontario's Mineral Development.

In the speech from the throne at the opening of the session of the Ontario Legislature on Tuesday reference is made to the mining industry of the province, which is described as making steady progress. The area of crown lands sold and leased under the provisions of the mines act has been largely in excess of that of any recent year, and fresh proofs have been found of the richness of the northwestern part of the province, where exploration has been most extended. This reference in the speech was seized on both by the movers of the address in reply and by the opposition. The discovery and development of great areas of rich mineral land have had the effect of raising the Government's mining policy from a state of comparative insignificance into the very first rank among the issues of the day. There is now scarcely any subject more contentious. A very large number of settlers have been attracted to the Rainy River and Western Algoma districts, where there are now several gold mines in active production. Thus the district, formerly a wilderness, is becoming settled and is producing wealth. Being nearly all crown land property, the Ontario Government is directly connected with its prosperity, as it controls the sale of the property, the opening up of the country by railroads, the regulations to which mining is subject, and the revenue obtained from the royalties. For these reasons, and for the further reason that the potential wealth of these regions is generally believed to be enormous, the mining policy received almost the chief attention, if not of the Government, at all events of its critics. The mining law will be up for amendment, certain concessions of the Government will be canvassed, and aid will be asked for railways. One thing that has undoubtedly been helpful to the mining industry in western Ontario this year was the action of the Dominion Government in placing many of the articles of mining machinery on the free list.

Almost the whole value of the increased output of the current year—for which there are no figures yet obtainable—is to be credited to the gold mines. The iron mines have proved disappointing again. At the beginning of the year there was a good prospect that certain properties west and north of Port Arthur on Lake Superior would be extensively worked. Fine magnetite iron locations were taken up near Greenwater Lake in that locality, and a shaft had been sunk at a point north of Port Arthur, near Finmark Station, in the hematite iron deposits there. Though the ore is said to be rich, workable, easy of access and easily mined, the operations entered upon last spring have not been followed up. Again, on the north shore of Lake Huron, the bright prospects of last spring have not been realized. It was expected that the Hamilton Blast Furnace Company would draw their chief supplies of material from there. A considerable sum was wasted in exploration, which seems to have turned out rather fruitless. Recently the company have been operating near the mouth of the Spanish River, but though the ore there is reported to be good and plentiful, and at the same time easily obtainable, work has stopped, as it has been found that it was being carried on beyond the limits of the company's claim. Negotiations for the purchase of the lands adjoining their own have now been entered into by the company.

One influence which has no doubt helped to arrest the development of iron ore deposits on the shores of Lake Huron and Lake Superior was the change made last April in the provisions of the act authorizing the payment of a bounty on pig iron. The new arrangement increased the bounty by $1 per ton, and extended it to iron made wholly or partially from imported ore. The law as it now stands provides that the bounty shall be $3 per ton on the proportion of iron made from Canadian ore and $2 per ton on the proportion made from imported ore. This change, being more favorable to the use of imported ore, has had a tendency to cause an increase in the consumption of it, and to lessen the motives for the working of our own ore beds. The Hamilton furnace is now using American ore.

Nova Scotia Coal.

The decision of the Dominion Coal Company to close their Gowrie mines and Victoria mines in Cape Breton has roused strong protests from the residents of Port Morien and Victoria mines. They have appealed to the Government of Nova Scotia, as the company's charter is a provincial one. G. H. Murray, the provincial Premier, has sent a note to the president of the company protesting against such action. If the company's order goes into effect four collieries will be closed after the 15th inst. The reason alleged is that they have ceased to pay. From the Gowrie mines 150,000 tons were shipped last year.

During the season of navigation which has just closed the quantity of coal sent up the St. Lawrence from the collieries of Nova Scotia was 921,000 tons, 127,000 tons more than came up during the season of 1896. The greater part of this coal was delivered at Montreal, though 123,000 tons were unloaded at Quebec.

Kingston's Industries.

Kingston and Abbott & Co. have been unable to come to terms, and it looks as if the difference would not be bridged. Abbott & Co. insist that the bonus of $50,000 be paid in monthly installments, to cover the expense of transferring the rolling mills from Montreal and setting them up in Kingston. The Citizens' Committee—a joint committee of the Board of Trade and the City Council—are unwilling to agree to that arrangement, holding that the bonus should not be paid until the works are erected.

The Kingston Lead Works, which have been closed for years, are likely to be reopened. A purchaser has been found for them and for the old Frontenac lead ore lands, which belonged to the estate of the company who used to operate the works. Another lead ore mine near the Perth road is also to be secured, and ore is to be smelted at the works for the owner of a lead mine near Arnprior.

Trade Items.

The Grand Trunk Railway Company have received 500 new freight cars, each of 60,000 pounds capacity, for general use on their system. The cars were built by the Michigan Car Company of Detroit. Another lot of 500 are being built in the railway company's own shops in Canada.

A large bonus has been offered by the City Council of Three Rivers, Quebec, as an inducement to the Great Northern Railway Company to make their terminus and establish their workshops in Three Rivers.

Another deputation from the natural gas fields in the vicinity of Windsor, Ontario, has waited on the Dominion Government. It consisted of owners of wells, who desire that there shall be no alteration of existing arrangements. They want to be free to continue piping the gas to Detroit.

E. E. Sheppard, the Trade Commissioner sent by the Dominion Government to South Carolina, has sent in his report for Brazil and Uruguay. Brazil, he considers, offers an excellent market for such Canadian articles as bicycles, agricultural implements, hoes, axes, rakes, spades, shovels, wagons, safes, sewing machines and wood working machines. The whole question of sale, he says, is dependent on credits. There is, he reports, an excellent demand.

The Minister of Customs has changed the rules relating to postal packages with advantage to business men. Heretofore postal packages coming from the United States were sent to one of 18 central Custom Houses, where the duty was collected. Now the rule is to be that the parcel must be sent for duty to the nearest Custom House. This will facilitate an important line of trade between customers in Canada and merchants across the line.

C. A. C. J.

It is expected that the city of New York will be obliged to issue about $40,000,000 of new bonds next year for public improvements.

Statistics issued from the office of the Secretary of State of Pennsylvania show a remarkable increase in the number of charters issued to manufacturing corporations in that State and in the increases of capital stock filed in the past few months as compared with last year's figures. In November, 1896, the total increase of capitalization was $524,000, whereas in November of this year it reached the large figure of $16,200,000.

The first annual report of the Montana State Board of Sheep Commissioners, just issued, shows that during 1897 that State led in wool production, 22,169,921 ponnds of wool having been sheared. Allowing for shipments out of the State, which have been heavier this year than ever before, there are 3,670,855 sheep in Montana, a net increase over last year of more than 500,000. The value of sheep has nearly doubled this year.

The Yukon Commercial Company of Seattle, Wash., have commenced the construction, at Ballard, Wash., of a steel steamer for traffic on the Yukon. It will be built entirely of mild ship steel, and will be the first of the kind built on the Pacific coast. The dimensions of the hoat are, deck 70 feet long, 17 feet 9 inches beam, 4 feet 6 inches molded depth. It will cost when finished $15,000.

The wash house operatives, of whom there are about 2000 employed in the tin plate mills dipping terne plates into the vats, have organized a trade union and will apply for admission to the American Federation of Labor at their meeting next week, at Nashville, Tenn. The wash house men in tin plate works are not included in the Amalgamated Association. It is said that the majority of these workers in the Pittsburgh, Ohio Valley, Wheeling and Indiana districts have joined the new organization.

TRADE REPORT.

Metal Market.

Pig Tin.—There has been hardly as much as a ripple upon the surface of the market during the past week. No speculative interest was manifested at any time, except in the direction of making "official" quotations occasionally, and neither consumers nor jobbers purchased except in a very conservative way. The importations have been moderate and the quantity of Tin afloat is below the average of late, but in the absence of any radical change in London wholesale prices here have been almost stationary. The retail trade was as inactive as the wholesale purchases, in view of the approaching stock taking season, covering little beyond immediate and pressing wants. Jobbers quote Straits Pig in small lots from store at 14¾c. per lb.

Copper.—The market has taken a decided turn for the better. Contracts have been entered by the Calumet & Hecla Company for a large quantity of Lake product deliveries running the first three months of next year. The quantity involved is somewhat in doubt, but probably exceeds 10,000,000 lbs. Prior to this deal a good many fair sized lots, probably 500,000 lbs. all told, exchanged hands at an advance of ½c. over last week's wholesale figures. Retail prices were unchanged, small lots of Lake Ingot ruling at 12¼c., and of Ansonia Grade Casting at 11¼c. per lb.

Sheet Copper.—The demand, as is usual at this late period of the year, was of a perfunctory nature, jobbers and consumers being unwilling to add to their stocks beyond the dictates of absolute necessity. Contracts for extended deliveries were comparatively few, manufacturers not seeking forward business at the present level of prices with any animation. Competition among jobbers for the small business that is passing has been somewhat more keen and prices in a retail way were not quite so strong, although 15c. per lb., basis, is still the nominal quotation for small lots of Sheet Copper from store.

Pig Lead.—A very dull market has been experienced and wholesale prices have fallen a fraction, leaving the market rather weak at the close. To all appearances the only outlet at present is among the smaller consumers, who almost invariably purchase in a hand-to-mouth way. Jobbers quote American Pig in small parcels from store at 4⅛c. to 4¼c. per lb.

St. Louis advices indicate a very dull market, with an utter absence of large purchases. A better demand is anticipated later, however, and some improvement in price may result.

Lead Pipe and Sheet.—A very moderate demand is noted for these materials. Consumers order only such amounts as they require for present use, and little is being done in the way of contracts for future deliveries. Improvement is looked for after the turn of the year, however, and manufacturers are looking also for better prices later on. In the Eastern market Lead Pipe is quoted at 5¾c. and Sheet Lead at 6¾c. per lb., subject to a discount of 20 per cent.

Spelter.—The market is softer, if anything, than it was a week ago. Galvanizers have made purchases at lower figures, and it appears easy to buy ordinary brands at prices which are low as any made within the past six months. The demand, nevertheless, has shown no appreciable expansion, buying being of an extremely tame character. Jobbers' prices have been shaded during the week. Ordinary Western brands are selling in a retail way at 4.50c. to 4.60c. per lb.

The market for Spelter in St. Louis is reported as dull and heavy, and it is thought that nothing but an early improvement in the demand can prevent a lower range of prices.

Antimony.—Prices have undergone no change and the demand continues moderate. Prices for small parcels remain at about 7¼c. to 7½c. for Japanese, 7¾c. for Hallett's and 8½c. for Cookson's.

Nickel.—Prices remain steady at about 37c. to 38c. for small quantities.

Solder.—The decline in Pig Lead has been followed by a reduction in the price of Solder. Genuine Half-and-Half is now quoted in a retail way at 10½c. to 10¾c. per lb., and No. 1 at 9¾c. to 10c., according to size of order.

Tin Plate.—Orders for American Cokes have been light and the market, as a whole, remains dull to the verge of stagnation, with wholesale prices a shade easier. Manufacturers have delivered more freely on contracts during the past week, and have thus kept many buyers fully stocked. The indications are that this will continue for some time, since a number of manufacturers are well sold up on their probable product of the first quarter of 1898. The smaller consumers are purchasing in a hand to mouth way only, and the volume of retail trade was very moderate, all told. No improvement is looked for before the middle of next month. Jobbers' quotations are unchanged, moderate sized lots of American Plates for spot delivery at New York, Philadelphia and Baltimore being about as follows: American Coke Tins, IC, 108 lbs.. 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do. 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3 40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are without important change in price and sell in a small way only.

Sheet Iron.—Tne market for both Black and Galvanized Sheets is somewhat quiet and mills are rapidly catching up on deliveries. There is no disposition, however, to press sales, and prices remain steady. A good deal of figuring is going on for Sheets for the first half of next year, and it is probable that some large contracts will be closed within a short time. Small lots from stock sell in this section at about 2 35c. to 2.40c. for No. 27 Common Black Sheets and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago avdvices are as follows: The demand for both Black and Galvanized Sheets has been considerably less, but mills are reported to be still crowded with work and manufacturers' quotations are maintained, although jobbers are cutting. Small lots from stock are quoted at 2.30c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—The demand is irregular and the market, as a whole, remains quiet. Both domestic and foreign buyers are holding off. Prices are unchanged. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3¼c.
Zinc	per lb. 2¾c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10 50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5 25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	5.00

THE IRON MARKET.

There is little to say of the market except that business is dull and prices are somewhat weaker. A great deal of material is going into consumption, but it is believed that the output is gaining; consequently there is an increasing pressure to secure new business. It is believed that the dullness is due more to temporary causes than to any unfavorable change in the outlook, which, as a matter of fact, is brighter than ever as regards the volume of business. Prices are somewhat unsettled, nevertheless, and it will take time to adjust them on a basis that will be satisfactory to all the interests concerned.

Foreign business is assuming very important proportions. There is a steady outflow of almost all kinds of manufactured Iron and Steel, besides Pig Iron, which is recognized as a regular article of export. The export of several hundred thousand tons of Iron and Steel during the coming year will be an important addition to the home demand, which is expected to surpass all former records.

Pig Iron.—The market in the New York district is a little better, so far as inquiry and moderate sales are concerned. Among the orders taken this week is one lot of 3000 tons for export. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No.

2 Plain, $10.75 to $11. Sonthern brands, same delivery : No. 1, $11 to $11.25 ; No. 2, $10.50 to $10.75 ; No. 1 Soft, $11 to $11.25 ; No. 2, $10.75 to $11.

In the Philadelphia market the demand for Pig Iron is very slow and in some cases there are reports of lower prices, but they are not sufficiently authenticated to warrant serious attention. There is no doubt that makers would be very glad to renew contracts at the association prices, and would probably give three or four months' deliveries, but in the meanwhile buyers stand out for lower prices. Although the feeling is not as buoyant as it was a month ago it is by no means certain that a lower range of prices will be established. Quotations are about as follows for seaboard deliveries, subject to the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75 to $11.

The largest reported sale of the week, in Chicago, was one of 1500 tons of local Iron for delivery in next six months. Other sales of fair size were made and on the whole the local producers take a very cheerful view of the situation. Prices are fully up to the level of the past month and seem to be getting firmer instead of weaker. Southern sales agents report a number of inquiries received, but buyers are deferring their purchases, probably in the hope that some weakness may develop. Thus far they have been unable to depress the market. We quote for cash as follows :

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

The Pittsburgh Pig Iron market continues quiet and prices for December Bessemer are lower. The consumption of Pig Iron at the present time is enormous, and with the capacity about all employed it would seem that prices on the present basis are about as low as they will go. There is considerable figuring going on for Iron for the first quarter and first six months of next year, but so far little actual business has been closed. Some speculators have again appeared and are getting prices on Iron with a view of buying. Foundry Irons continue quiet. We quote f.o.b. Pittsburgh as follows: No. 1 Foundry, $10.65 to $10.75; No. 2, $10.15 to $10.25; Bessemer, $10.

There has been a very material increase in the number of orders for Pig Iron in Cincinnati, and while none of these have been for anything like round lots, yet they have been coming in from all classes of consumers from all sections of the country tributary to that point, quite a large percentage of them by telegraph, and all of them in a hurry for the immediate delivery of the goods. The number of those inquiring for large amounts has increased a trifle, though none of this inquiry for round lots within the past week or two has developed into actual transactions. The small run of orders which are being taken are, as a rule, going at full quotations. It is believed that some Iron can be bought at less than the regular quotations, but the offerings in this way are not large enongh to materially influence general trade. In a word, quotations are nominally unchanged, and in the absence of anything to the contrary may be said to be fairly steady. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to $9.75
Southern Coke, No. 3	9.00 to 9.50
Southern Coke, No. 1 Soft	9.75 to 10.00
Southern Coke, No. 2 Soft	9.50 to 9.75
Southern Coke, Gray Forge	9.00 to 9.25
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The St. Louis market continues in the quiet condition last noted. New contracts are hard to close, as consumers are not anxious to do anything until after the turn of the year. Shipments on contracts already in force are being ordered forwarded, and there is more or less complaint on the part of consumers because of the inability of furnaces to make prompt shipments. Stocks on furnace banks were never so low, and are being decreased daily, while prices are being strictly maintained at the prices quoted below. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.50 to $11.00
Southern, No. 2 Foundry	10.25 to 10.50
Southern, No. 3 Foundry	10.00 to 10.25
No. 1 Soft	10.25 to 10.50
No. 2 Soft	10.00 to 10.25

CHICAGO REPORT.

Scrap.—The market for old material is extremely quiet. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$6.75	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3 75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5 50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9 c.
Red Brass	....	7½c.
Yellow Brass	....	6½c.
Light Brass	....	4 c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—No improvement has taken blace in the demand and concessions are still made. The card on carload lots of 12 tons minimum is now as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

The Keystone Bridge Works of the Carnegie Steel Company, Limited, at Pittsburgh, have commenced tearing out the long viaduct leading to the bridge on the Pittsburgh & Lake Erie Railroad which spans the Ohio River at Beaver, Pa. This is being done preparatory to rebuilding the bridge to accommodate double tracks. When this has been accomplished the Pittsburgh & Lake Erie Railroad will be double track throughout from Pittsburgh to Youngstown, a distance of 68 miles. We have already made mention in these columns of the fact that three new locomotives built by the Pittsburgh Locomotive Works have been put in service and are hauling trains of about 75 cars between Pittsburgh and Youngstown. Recently two more of these engines have been placed on the road. A contract has been placed with the Pittsburgh Locomotive Works for five more. Very extensive improvements are being made and are contemplated by the Pittsburgh & Lake Erie Railroad. A large amount of money has been spent equipping yards at Haselton, on the main line, and also at Glassport, on the Monongahela division. The rolling stock is being improved wherever it can and new freight sheds and a new depot are being built on the south side of Pittsburgh. It is the intention to put this road in position to meet any competition which may come from any source. The building of this road was of very considerable advantage to manufacturers of Pittsburgh and also the Valleys, as it established a new connection between Pittsburgh and Youngstown, while before it was built there was but one road, this being controlled by the Pennsylvania Company.

The City Council of Chicago have passed an ordinance providing for the elevation of 12 miles of tracks of the Chicago & Northwestern and Chicago, Milwaukee & St. Paul Railroads, at an estimated cost to those companies of $3,200,000. Further ordinances of a similar nature are pending in connection with other roads.

THE HARDWARE TRADE.

Business feels the influences which at the near approach of the holiday season tend to diminish the volume of trade, but on the whole the demand continues fair, and in some lines it is still very satisfactory. The tone of the market is on the whole steady, but perhaps not quite so strong as it has been, manufactured products reflecting the condition of the markets for raw material and the lessened demand which is to be expected at this time. The matter of the consolidation of Wire Rod interests continues to attract the attention of the trade at large, and while the negotiations are simply progressing and have not been consummated, they have an influence on the market, stimulating purchases, especially of Wire and Wire Nails. It is obvious, however, that if the project is carried out it will have a much wider bearing and that other lines will promptly feel the effect. The closing month of the year seems likely to be a fair one, and some of the jobbers report business in better volume than usual. Matters connected with the closing up of the business of the year and preparations for the annual inventory are receiving attention, while merchants and manufacturers alike are naturally beginning to consider definitely their plans and projects for the coming year.

Advices from Chicago.—Jobbers report an extraordinary demand for the time of the year. The continued good trade shows that farmers have plenty of money and that the West is therefore prosperous. The movement is good in everything. It might be supposed that the lateness of the season would interfere with Builders' Hardware, but this is also called for in good quantities. Holiday merchandise is moving freely. Skates are in heavy demand. Snow Shovels have suddenly become objects of interest, owing to the deep snows in a large part of the West. The month undoubtedly will make a good record. Sales in November were far ahead of November of last year, and December will also make a good showing for itself. The demand for Heavy Hardware keeps up equally well.

Advices from St. Louis.—The Hardware jobbing trade is nearing the point where it reaches close to absolute dullness. The last half of December is invariably dull, and this month will not likely prove an exception to this rule. The jobbers are now making comparisons, and the business done this year will show substantial gains over last year. Much interest attaches to the proposed combination among the Wire interests, and while jobbers as a rule do not look for any advances should the combination go into effect, yet they are naturally interested, as it is likely to bring about radical changes, particularly as regards the selling department. The demand just now runs largely to staple and holiday goods, and while there are no radical changes in prices to note, the tone of the market is not as strong as it might be. Collections are quite satisfactory.

NOTES ON PRICES.

Wire Nails.—There has been little change since our last issue in the general features of the Wire Nail market. There has been a good deal of activity in the market, jobbers and retailers alike endeavoring to cover their early requirements before the advance they anticipate takes place. Meanwhile the negotiations between those interested in the Rod consolidation are continued, and those directly identified with the movement report favorable progress. It is acknowledged, notwithstanding the reports current in the daily papers, that the project is not yet consummated, and it obviously cannot be accepted as an accomplished fact until many details are settled and the contracting parties have formally assented. The opinion of the trade is divided in regard to the probability of the consummation of the plans in hand, but the fact that an effort is being made in this direction has its effect on the market, of which the manufacturers are prompt in taking advantage. New York quotations are $1.60 to $1.65 for small lots from store.

Advices from Chicago.—The situation has changed decidedly. The Hardware trade have now thoroughly wakened up to appreciate the fact that the proposed consolidation of Wire interests may be consummated. Very heavy inquiries have been turned down the past week by manufacturers. Some have withdrawn all quotations, while the others have advanced their prices. Nobody is quoting for January delivery at present prices, but an advance of 10 cents is asked. Jobbers have also revised their prices and are now quoting $1.50 for small lots from stock.

Advices from St. Louis.—Rumors regarding the combination of Wire interests are thicker than snowflakes, and yet they have such a tinge of genuineness that mills have advanced their prices and are not disposed to accept business except for immediate shipment. Inquiries are in the market for large quantities of Nails, but sellers are hard to find except at a material advance. Jobbers have advanced their prices and are a unit in asking $1.60 to $1.65, base, for small lots from store.

Cut Nails.—There is very little change to note in the Cut Nail market. The demand is only moderate, and buyers are evidently deferring purchases so as not to carry over heavy stocks into next year. New York quotations for small lots from store are $1.35 to $1.40.

Advices from Chicago.—No change has occurred in Cut Nails, which are still selling at $1.45 for small lots from stock.

Advices from St. Louis.—The market shows no signs of improving, and the low prices referred to in our last report continue to rule. Jobbers ask $1.40 to $1.45, base, for small lots from store.

Barb Wire.—The volume of business has increased in view of the proposed Rod pool, and the market is firm.

Advices from Chicago.—The change in the Wire Nail trade also has its related movement in this branch. Former prices have been withdrawn by manufacturers. Jobbers quote small lots from stock at $1.60 for Painted and $1.90 for Galvanized.

Advices from St. Louis.—The market is quiet, but manufacturers have taken advantage of the probable favorable outcome of the Rod combination and advanced prices.

Glass.—The Window Glass situation has shown no change during the past week. No agreement has been reached regarding the wage scale and none of the associated factories have resumed operations. Retailers are complaining at the price asked for Glass by jobbers, which is 60 per cent. discount both East and West. The complaint is making itself manifest in a further diminution of business. The uncertainty as to just how soon the associated factories—or, as they are now known, the American Glass Company—will resume prevents orders being placed for foreign Glass in sufficient quantities to supply the demand. Imported Glass is quoted at 80 and 10 per cent. discount, and not at 60 and 10 per cent. discount, as was erroneously stated in this report last week.

White Lead.—Orders for Dry Lead have been very fair, but chiefly for moderate quantities for delivery during the balance of the year. The dealings in Lead in Oil, while only fair in volume, were quite as liberal as could reasonably be expected. No changes in prices have been made by the leading corroders, and no intimation is given of any intended revision of current list prices and terms in the immediate future.

Red Lead.—There has been fair buying of moderate sized lots for early delivery, and some contracts were closed for good sized parcels for delivery during the fore part of next year. Prices were virtually the same as have prevailed for a considerable time past.

Linseed Oil.—The cost of Seed has advanced further during the past week, but the demand for Oil has continued slow for the season and dealings at present are on a rather small scale. Oil is relatively lower than Seed at the moment, but the probability that higher figures for the latter would lead to sharper competition prevents any considerable advance in prices.

Spirits Turpentine.—Business has fallen off somewhat and retail prices have weakened slightly, or to 33½c. to 34c. for small lots.

Northwestern Material Progress.

During the present winter the amount of timber to be cut in the forests of Minnesota will probably exceed any preceding season, and will be nearly double what was cut in the last winter. The Mississippi district will cut this winter not far from 550,000,000 feet, as against 240,000,000 last winter, while the Duluth district will cut 500,000,000, the St. Croix 350,000,000 and the new Red Lake region 150,000,000. Of all this 400,000,000 feet will be taken out of the woods by railroad, there having been a movement toward hauling timber by railroads in the past few years that has grown to immense proportions. It is estimated that 20,000 men and 10,000 animals will be employed in the woods the entire winter, and that the wages paid the men will be above $20 a month on the average. A year ago there were not over 10,000 men and their wages were not over $15 a month.

The Calumet & Hecla Copper Mining Company have just declared a fifth $10 dividend for the current calendar year, making total dividends for their existence $50,850,000.

Dividends have been paid by the mines included in what is known as the Homestake group in South Dakota of $11,207,500, of which the Homestake, the largest of the group of three, has paid more than half. In the past year the Homestake has crushed almost 400,000 tons of rock,

and the other two companies not far from the same quantity. The value of rock from the Homestake proper in the past year has averaged $4.78 a ton, for which all but $1 went to pay operations. About 0.5 per cent. of the company's returns were from silver, the rest from gold. The Black Hills, as a whole, in which are these mines, will this year win about $9,000,000 in gold.

It looks as if the elevators on Lake Superior would be swept clean of wheat by the close of navigation this year, which is likely to be later than was ever known. About 4,000,000 bushels of wheat are sold to go East yet before the close, most of it to exporters, though 500,000 bushels go to P. D. Armour, at Chicago. Rates to vessels have risen to 5 cents a bushel, at which one of the new freighters can earn $10,000 a trip.

The town of Eureka, S. D , which enjoys the distinction of being the greatest primary wheat market in the world, has received on the present crop 1780 carloads of wheat and flax, and its farmers have taken in about $1,500,000 cash for their grain and stock. The district around Eureka is settled almost entirely by families from Russia, and the C., M. & St. P. road is the only line touching the place.

Lake Ore Matters.

DULUTH, December 2, 1897.—It is understood that under the new Tilden lease to the Carnegie interests the royalty to be paid will be 50 cents a ton. Mr. Rockefeller will take half of this as well as a bonus of $500,000, a sum that is supposed to go very far toward paying for the improvements put into the mine. The old royalty to the fee holders, 30 cents a ton, has been reduced to 25 cents, so that the full royalty cost to the Oliver Company is 50 cents a ton. With lowest possible mining costs, even at a mine operated at very low underground expenses, a royalty of this amount and lake freights equal to those paid by Mesaba and Vermillion mines, the new operators of the Tilden can scarcely expect to deliver ore at a cost very much lower than some other properties. The minimum agreed output is 400,000 tons a year, and the lease is to run 50 years.

The contemplated increase in authorized capital stock of the Duluth & Iron Range Road from $3,000,000 to $10,000,000 has been made, but no steps will be taken at present, nor probably for some time to come, to add largely to the $500,000 total issued capital. The stock will be disposed of as money is needed for extensions. These contemplated extensions, as outlined by the company, include a line of 63 miles east from the road's present terminus at Ely to the mines of Gunflint Lake, where a connection will be made with the railway running to Port Arthur, on Lake Superior, in Canada. Another line is planned into the Rainy Lake gold region of West Ontario. Another is a direct Mesaba line from the company's Two Harbors docks, cutting off two sides of a triangle and touching the Mesaba in the vicinity of the Fayal and Genoa mines.

Capitalists are understood to be looking at Lake Superior, more particularly Marquette, as a possible location for an extensive iron and steel industry. Newspapers at Duluth and Superior have for a long time amused themselves and tickled their readers by their predictions of the early control of the works of a concern with a sounding title—the West Superior Iron & Steel Company—by John D. Rockefeller. So far as making steel is concerned the present plant of this company is not of much value, and would have to be not only remodeled but entirely rebuilt and enlarged before it could make any impression as a competitor. Mr. Rockefeller is not an iron maker and doesn't want to be, and the prophecies that are made are simply ridiculous. The same people have named the Carnegie interests as also likely to locate at the head of Lake Superior. This prediction is as preposterous as the other.

A 10 per cent. increase of wages is to take place at the leading Menominee mines January 1, bringing the scale paid there about up to those of the Marquette and Vermillion ranges, where miners fare better than elsewhere.

W.

Anthracite Coal Trade.

The December letter of the Anthracite Coal Operators' Association says: Throughout the past month the market has been one of weakening prices and slow and irregular demand. Dealers have, almost without exception, reduced their stocks to a merely nominal amount, and the few days of cold weather brought about a momentary activity in buying from first hands, which, however, disappeared quickly. The entire trade of the tidewater and Eastern markets has been in the buyers' hands, and they have set a figure which they would pay, in the certainty that if the coal could not be purchased at that price from one seller it could be had from some other one. The ease with which this could be done demoralized prices, until, at the close of the month, no figure could be named for the maximum, minimum or average of the market. Beginning with December, there is to be a radical change in the methods which have been pursued. Colliery time will be reduced nearly one-half, bringing the probable output to 3,000,000 or 3,500,000 tons for the month. This will enable the companies to dispose of both the tonnage mined and that held in stock along the lines, and at the same time will strengthen prices in all markets. This latter will be more easily accomplished since dealers have exceptionally small stocks on hand and will be compelled to purchase for their current demand.

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 9, 1897.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style,	
36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style,	
20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade,	
12 to 14 lbs. coating	9.00@ 10.00
$\frac{\text{B T P}}{\text{L}}$ Grade,	
10 to 12 lbs. coating	8.00@ 9.00
Dean Grade,	
8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	₩ lb 1.90¢	2.50¢
17 to 20	₩ lb 2.00¢	2.60¢
21 to 24	₩ lb 2.10¢	2.70¢
25 and 26	₩ lb 2.20¢	2.80¢
27	₩ lb 2.30¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ₩ lb, A....$10.20 } 10%
Patent Planished, ₩ lb, B.... 9.20 } dis.
Craig's Polished Sheet Steel.....8½¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake..... 11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.

Small lots..... ₩ lb, 40¢
100-lb lots.....₩ lb, 36¢

No. 2 (guaranteed over 90% pure).

Small lots.....₩ lb, 34¢
100-lb lots.....₩ lb, 33¢

Nickel Aluminum Casting Metal.

Small lots.....₩ lb, 39¢
100-lb lots.....₩ lb, 35¢

Special Casting Alloy, with over 80% pure Aluminum used in place of brass.

Small lots.....₩ lb, 35¢
100-lb lots .....₩ lb, 30¢

Aluminum Rolled Rods, from ¾ to 1 inch diameter.....₩ lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....₩ lb, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 lb or more. Less quantities, 5¢ ₩ lb additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	₩ lb	₩ lb	₩ lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping .....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne .....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. ₩ square,	$4.75	$4.50
Galv. ₩ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....₩ lb 2 ¢
" " Brown.....₩ lb 1½¢
" " Purple .....₩ lb 2½¢
" " Ground in oil, B. Red, ₩ lb 6½¢
" " Ground in oil, Red...₩ lb 6½¢
" " Ground in oil, Brown, ₩ lb 5½¢
" " Ground in oil, Purple, ₩ lb 6½¢
Linseed Oil, Boiled, in bbls.....37¢
Linseed Oil, Raw, in bbls.....35¢
Mineral Paluts.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs 3 to 6 ¢
Sipe's Japan Oil, in bbls., ₩ gal.....34¢
Spirits Turpentine, in bbls., ₩ gal....35¢
Asphaltum, Trinidad Refined, ₩ ton.$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.25
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ₩ roll 108 sq. feet.....$1.25
Roofing Pitch, ₩ bbl. of 300 lb.....$3.00

NEW YORK, DECEMBER 10.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₱ ℔, 40¢
100-℔ lots.....₱ ℔, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₱ ℔, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 ℔s or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₱ ℔	₱ ℔.	₱ ℔.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 ℔s 5¢ ₱ ℔ extra.

Antimony—

Cookson.....₱ ℔, 8½@8¾¢
Hallett's.....₱ ℔, 7¾@8¢
Japanese.....₱ ℔, 7½¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per ℔.
¼-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
⅛-in. up to ⅝-in.	.38
⅛-in. up to ⅛-in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
8-16-in. up to ½-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive.	.38

35% off.

Copper & Bronze Tubing—

3¢ ₱ ℔ more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₱ ℔ 18½@19¢ basis *Ingot.*
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₱ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₱ ℔, 2.00....	2.30¢
Nos. 17 to 21.....	₱ ℔, 2.10....	2.40¢
Nos. 22 to 24.....	₱ ℔, 2.20....	2.50¢
Nos. 25 and 26...	₱ ℔, 2.30....	2.60¢
No. 27.....	₱ ℔, 2.40....	2.70¢
No. 28.....	₱ ℔, 2.50....	2.80¢
American B. B.....		₱ ℔, 4¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₱ ℔, 10½@10⅝¢
Do. Stained.....6¢@10¢
Patent Planished ₱ ℔, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₱ ℔ 8½¢

Galvanized.

Nos. 10 to 16.....	₱ ℔, 12¢	75&10% 5% off.
Nos. 17 to 21.....	₱ ℔, 13¢	
Nos. 22 to 24.....	₱ ℔, 14¢	
Nos. 25 to 26.....	₱ ℔, 15¢	
No. 27.....	₱ ℔, 16¢	
No. 28.....	₱ ℔, 17¢	
No. 29.....	₱ ℔, 19¢	
No. 30.....	₱ ℔, 21¢	

36 in. 1¢ ₱ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4⅜¢
Bar.....5¢
Pipe.....5¾¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6¾¢. 20%
Old Lead in exchange, 3¼¢ ₱ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔.....5¾@6¢
Lead. Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1½¢
Red Venetian, American..... @1¾¢
Linseed Oil:
Raw, ₱ gal.....40¢
Boiled.....42¢
Spirits Turpentine:
In hbls.....33½@34¢
In cases.....41½@42¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₱ ℔ 5 ¢
Clarified.....₱ ℔ 4⅞¢
Accra.....₱ ℔ 4¾¢
Half Jack.....₱ ℔ 4½¢
Cecilia.....₱ 100 ℔ $4.85
Choice Red.....₱ 100 ℔ 4.60
(*Spot Oil*, ½c. ₱ ℔ *higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....₱ gal. 10@11¢
Kerosene.....₱ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints)..70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....00%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....00%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin Clamps.....00%
" " Plumbers' Joy, 50¢ ₱ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75&10%
Galvanized Iron Range Boilers above 52 gallon.....70&5%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanized Iron Range Boilers, Extra Heavy, above 52 gallon.....70%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated.....40&10%
Solid Bronze.....25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%

1896 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₱ ton.....$30.00@$35.00
Asphaltum, Rock, ₱ ton.....$14.00
Coal Tar Felt, 1 ply, ₱ ℔.....2¢
2 Ply Roofing, ₱ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₱ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₱ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₱ bbl. $1.47@$1.48
Rosin, E. & F.....₱ bbl. 1.52@ 1.60
Rosin, G. & H.....₱ bbl. 1.65@ 1.70
Rosin, I. & K.....₱ bbl. 1.80@ 1.90
Rosin, M. & N.....₱ bbl. 2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.

Pennsylvania:

Best Baugor, ₱ sqr.....$3.75@$5.00
No. 1 Baugor Ribbon.....3.35@ 3.75
Pen Argyle, ₱ sqr.....3.75@ 4.35
Peach Bottom, ₱ sqr.....4.75@ 5.60
No. 1 Chapman, ₱ sqr....3.80@ 4.80
Lehigh Slates, ₱ sqr.....3.00@ 4.50

Vermont:

Sea Green, ₱ sqr.....$2.50@$3.55
Purple, ₱ sqr.....3.25@ 4.00
Unfading Green, ₱ sqr...3.75@ 4.50
Red, ₱ sqr.....9.00@11.00

Solder and Soldering Fluids—

Solder—

½&½ guaranteed.....10½@10¾¢
No. 1.....9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....00¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels, ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔, ₱ ℔.....3½¢
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₱ ℔.....4¢
5% dis.

Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, ₱ ℔.....40¢

Soldering Coppers—

Per ℔.....15½¢@17½¢ net

Spelter—

Western Spelter.....4½@4.60¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₱ ℔.....15¼¢
Straits, pigs, ℔ ℔.....14¾¢
Straits, in bars, ₱ ℔.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per hox on lighter Plates than IC, 14 x 20, is as follows:

100 ℔	10¢
95 ℔	15
90 ℔	20¢
85 ℔	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per hox advance:

Standard Old Style, 36 to 40 ℔ coating	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating	8.00 @ 9.25
STP / L Grade, 10 to 12 ℔ coating	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....$9.10
IXX, 14 x 28..(112 sheets).....9.80
IXX, 14 x 31..(112 sheets).....10.85

Tin Plates, Imported—

Duty, 1¼¢ ₱ ℔.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20	$5.00
" "	IX,	14 x 20	6.00
Allaway Grade,	IC,	14 x 20	4.25
" "	IX,	14 x 20	5.00

Coke Plates, Bright—

Steel Coke, IC, 14 x 20.....$4.25
IX, 14 x 20.....5.25

Terne Plates—

MF, IC, 14 x 20.....$6.25
20 x 28.....12.50
Worcester Grade, IC, 14 x 20.....4.25
20 x 28.....8.50
Dean Grade, IC, 14 x 20.....4.00
20 x 28.....8.00
Gilbertson's Old Method, IC, 14 x 20..7.50
20 x 28..15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved patteru, ₱ doz...18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

¼ and less, Plain.....72%
¼ and less, Galv.....67%
⅜ and larger, Plain.....78%
⅜ and larger, Galv.....70%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
" 2½ inch and larger 75%

Zinc—

600 ℔ casks ₱ ℔ 5¾¢ | Per ℔.....6¼¢

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Architectural Ornaments.
Frand, Martin J. & Co., Camden, N. J.
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Weitzel, J. F., Cincinnati, Ohio.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Range.
Wolff, L. Mfg. Co., Chicago, Ill.

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Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Souther, E. E. Iron Co., St. Louis, Mo.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

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Crawford & Young, Boston, Mass.

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Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawreuce-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.
Weitzel, J. F., Cincinnati, Ohio.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

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Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
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Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

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Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

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Cooney, Seiner & Co., Indianapolis, Ind.

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Arcade Mfg. Co., Freeport, Ill.
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Greene, W. F., Troy, N. Y.
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Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

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Berger, L. D., Philadelphia, Pa.
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Eddy Electric Mfg. Co., Windsor, Conn.

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St. Louis Stamping Co., St. Louis, Mo.

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Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
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Carton Furnace Co., Utica, N. Y.
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Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
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Tubular Heating & Ventilating Co., Phila., Pa.
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Hull, M. L., Cleveland, O.

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Jackson, W. Sons, 246 Front St., N. Y.

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Drake, W. H., Newark, N. J.
Empire Heating Co., Easton, Pa.
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Salem Nail Co., 292 Pearl St., N. Y.

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Galt, John & Sons, 253 Broadway, N. Y.
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Sap Spouts.
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Schools and Colleges.
International Correspondence Schools, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.

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Detroit Smelting and Refining Works, Detroit, Mich.

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Mersick, C. S. & Co., New Haven, Conn.

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Miner & Peck Mfg. Co., New Haven, Conn.
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Ætna-Standard Iron & Steel Co., Bridgeport, O.
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Shingles and Tiles, Metallic.

Berger Mfg. Co., Canton, O.
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Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Sinters' Tools.

Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N.Y.
Follanshee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Hull, M. L., Cleveland, O.

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Ostrander, W. R. & Co., 204 Fulton St., N. Y.

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McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.

Bascom, H. Clay & Co., Troy, N. Y.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros., Phila., Pa.
Martin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Clark, Henry N. Co., Boston, Mass.
Marcy Stove Repair Co., 74 Beekman St. N. Y.

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Greene, W. F., Troy, N. Y.

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Bibb, B. C. Stove Co., Baltimore, Md.
Bussey & McLeod Stove Co., Troy, N.Y.
Champion Steel Range Co., Cleveland, Ohio.
Eclipse Stove Co., Mansfield, O.
Graff & Co., 208 Water St., N. Y.
Magee Furnace Co., Boston, Mass
Michigan Stove Co., Chicago, Ill.
Mt. Penn Stove Works, Reading, Pa.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., New York.
Weir Stove Co., Taunton, Mass.

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Reineke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Tea Kettles.

Central Stamping Co., 23 to 25 Cliff St., New York.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.

Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. O. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate. (*Mfrs. of.*)

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Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.

Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.

Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Valves.

Eastwood Wire Mfg. Co., Belleville, N. J.
Goodrich, Judson A. Co., 120 Beekman St., N. Y.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.

Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.

Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.

Marston, I. G. & Co., Boston, Mass.

Water Closets.

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Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co., 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct.

Zinc, Sheet.

Phelps, Dodge & Co., 11 Cliff St., N. Y.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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IT WILL PAY TO GET OUR PRICES FOR

Genuine Bangor Roofing Slate

BEFORE PLACING YOUR ORDERS.

BANGOR EXCELSIOR SLATE CO., - Easton, Pa.

QUARRIES AT BANGOR, PA.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A SUPERINTENDENT to take charge of the manufacture of a line of tinners' tools in a well equipped machine shop making other goods; must be acquainted with the patents on such tools and machines and capable of designing them; good selling organization ready for the productions of a thoroughly capable man; state age, experience and references. "Tinners' Tools," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

A man to do TINNING, PLUMBING and FURNACE WORK in a good town of about 3000 inhabitants. L. P. Smith, 69 Main street, Camden, N. Y. Dec. 11

A good experienced SALESMAN for Western New York territory, must have an acquaintance among the trade in this section, by a Western stove foundry; state age, experience, past employers and amount of yearly sales. "Western New York," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

Two first-class experienced STOVE SALESMEN to sell a leading trade-mark line in Iowa. Address, with full particulars, "Leading," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

A first-class CUTTER, CORNICE and SKYLIGHT MAN; must be a good draftsman and thoroughly competent in every respect and able to figure accurately from architects' plans, and willing to take hold of anything that comes up, either inside or outside work. Timberlake & Nance, Huntsville, Ala. Dec. 11

SALESMAN traveling through northwest part of Indiana and western half of Michigan to handle a good line on commission; one visiting stove and hardware trade preferred. Box 243, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 11

At once, a bright, energetic man who can hustle in the jobbing, tinning and plumbing lines, as usually found in a country shop, in Northern Pennsylvania; must be able to do work so it will stay done; work every day the year round and year by year if satisfactory; must have correct habits and come well recommended. "H.," No. 1211, office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

January 1 a good TINSMITH; one who can repair bicycles preferred; no one need apply without good references; a steady job for the right man in New England city of 20,000 inhabitants. "H. L. A.," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Dec. 11

A thoroughly competent SALESMAN for New England; one who has had experience and knows the trade. Address with references Rathbone, Sard & Co., Albany, N. Y. Dec. 11

By a tin plate and metal house SALESMAN acquainted with the trade in Middle and Western New York State, Western Pennsylvania and Northeastern Ohio; also one acquainted with the trade in the States on the Atlantic seaboard: none but those thoroughly acquainted need apply. "Metal," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

A first-class PATTERN FITTER; give references. "Stoves No. 124," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

Young man as CLERK in hardware store. Address, giving age, experience and salary expected, "R W.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

A1 all around METAL WORKER; make estimates from plans, tin work, slating, galvanized iron and furnace work; good mechanic and hustler. "Tinner," General Delivery, Kansas City, Mo. Dec. 4

SALESMEN to sell as side lines to the hardware, stove and house furnishing trade several good selling, desirable specialties; liberal commission; mention territory; references exchanged. "H.," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Dec. 4

SITUATIONS WANTED.

As an EXPERT on defective ranges and furnaces. "F. D.," office of *The Metal Worker*, 232-238 William street, New Yrok City. Dec 11

A TRAVELING SALESMAN with established trade in Maine, New Hampshire and Vermont would like position with some large concern not represented there in the kitchen furnishing line. "W. R.," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Dec. 11

By a first-class STOVE MOUNTER and FILER; experienced on repairs; references given. "Mounter," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

A steady position by a PLUMBER, GAS and STEAM FITTER; 30 years' experience in city and country; can take charge and estimate from plans; perfectly steady; references from past employers. "Industry," No. 1211, office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a good boy willing to work; can do tin and slate roofing, cornice and skylight work; can work from plans; references; wages $9 per week. John G. Werner, care Mrs. Bellion Van Nest, Victor street, Westchester, New York. Dec. 11

By a STOVE PATTERN MAKER in a stove foundry; understands making drawings, both mechanical and ornamental; good carver and designer, having had some 20 years' experience in that line. J. T. Tryon, 92 Roebling street, Brooklyn, N. Y. Dec. 11

By a young man who thoroughly understands the completion of cornice and erection of steel ceilings. "H. D. T.," Canton, Ohio. Dec. 11

By a first-class STOVE PATTERN FITTER and FILER, also MOUNTER; 20 years' experience in stove foundries; have had charge of pattern and mounting shops; reference from present employers; moderate wages for steady job; 32 years of age; single, sober and industrious. "J. M. H.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a SOLDERER with over ten years' experience; handy around machinery; wages $6 a week. "Martin," care J. R. Brown, 72 Prince street, Brooklyn, N. Y. Dec. 11

By a first-class TINSMITH and ROOFER; 18 years' experience; married. B. Straus, 637 East Fifth street, New York City. Dec. 11

A line of cheap tinware on commission by a SALESMAN of experience whose territory is Eastern Colorado, Kansas and Nebraska. "Cheap," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a first-class plumber; 12 years' experience; country preferred. Thomas McCarthy, 99 Nostrand avenue, Brooklyn, N. Y. Dec. 11

By a first-class TINNER; pump and all kinds of iron pipe work; wish to make a contract with a firm for a steady job; have a full set of pump and tin tools; 12 years' experience; 32 years of age; married. P. O. Box 39, Harrodsburg, Ky. Dec. 11

SALESMAN with an established trade with the hardware, stove and house furnishing trade through the Southern States, is posted on all kinds of stove and tinware, is open for an engagement for the year 1898. "Southern," 519 Freemason street. Norfolk, Va.. Dec 11

A SHEET IRON and TIN WORKER, first-class and experienced in every branch of the trade, including estimating, designing and cutting, would like a steady situation; is 50 years of age; sober and reliable; can act as salesman, &c., if necessary; non-union shops only; will accept position at employer's own figure. Address till January 1, "Guarantee," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a young man 29 years of age, well experienced in the plumbing, steam and hardware business, best of references, as TRAVELING SALESMAN or inside man. "J. T. M.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By January 1, 1898, by a SALESMAN of 16 years' experience in stove, hardware and plumbers' supplies; ten years' experience traveling through Massachusetts and Connecticut; first-class references. "G. W. S.," 109 Milk street, Boston, Mass. Dec. 11

An experienced FOREMAN, DRAFTSMAN and ESTIMATOR desires to correspond with parties in the cornice and sheet metal trade in need of such a man; best of references as to ability and reliability furnished. A. C. Tietze, Girard avenue, Camden, N. J. Dec. 11

Practical MACHINIST and STEAM FITTER; will take charge of erection of steam or hot water heating plants or power work; temporary or permanent engagement; expert in estimating costs, drawing plans, taking charge of erecting new work or making repairs and correcting defective systems; moderate wages; best of references. "Mechanical," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

Steady position by a thorough first-class PLUMBER; neat lead and brass worker; can do tin work if necessary. "K," P. O. Box 99, Monticello, N. Y. Dec. 4

As SALESMAN with some good firm selling stoves, ranges, furnaces, tin plate, metals, stamped ware and gasoline stoves; long experience; good reference. "Ohio," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By a SALESMAN with some good house to represent a line of hardware, tinware or house furnishing specialties; can speak German and English; long experience. "Road, 1898," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By a young man 19 years of age as TINSMITH in some country shop; has had about four years' experience at tinning, pump and stove work; has also worked at plumbing; can furnish references; reasonable wages expected. Roscoe Batey, P. O. Box 99, Patchogue, L. I. Dec. 4

By a thorough experienced MANAGER, BOOKKEEPER and TRAVELING SALESMAN; has had 20 years' foundry experience; unexceptionable references. "Alexandra," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Dec. 4

By a strictly first-class MODELER and CARVER for stove pattern or architectural work; can work in clay, plasteline, wax, wood, plaster and white metal; good ornamental designer. "Modeler," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

As SUPERINTENDENT or FOREMAN of a stove foundry; capable of taking charge of whole or any part of plant; willing to work for a reasonable salary; best of references. "A1," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By an experieced architectural, ornamental and figure MODELER and WOOD CARVER for metal stamping dies and iron works; capable of doing his own designing; references given. M. Foderberg, 290 Pleasant avenue, New York City. Dec. 4

By a first-class CORNICE and SHEET METAL WORKER; 18 years' experience at all branches of the trade; considered a fast workman; can work from drawings and get out own patterns; best of references as to workmanship and character; prefer Southern States. "Tinner," 7710 Wallace street, Chicago, Ill. Dec. 4

A SALESMAN who calls on the hardware trade in the coal fields of Pennsylvania would like to get in communication with a good tinplate house to sell their goods as a side line; can do a fair business from the start for them; name commission; good reference given if desired. "A. B. C.," General Delivery, Wilkes-Barre, Pa. Dec. 4

As SALESMAN for furnaces, steam and hot water heaters; six years on road in West; am practical tinner; strictly temperate; middle aged; first-class references; open for position on the road or as resident salesman and foreman or bookkeeper. "Practical," 1742 South Twenty-eighth street, Omaha, Neb. Dec. 4

By young man 35 years of age (a hustler) as TRAVELING SALESMAN; 14 years' experience on the road for stoves and tinware; have traveled Pennsylvania, Delaware, Maryland, Virginia, West Virginia and Washington, D. C. "Hustler," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

By a practical DIE and TOOL MAKER as foreman or superintendent; familiar with typewriter, sewing machine, clock and bicycle work; have had experience at the bench, drawing board and as superintendent; can handle men with good advantage and good results; age 30; can accept January 1, 1898; best of references. "H. R.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

An experienced stove, furnace and boiler TRAVELING SALESMAN is open for an engagement for '98; large trade acquaintance in Central and Eastern States; A1 references from leading manufacturers; speaks the German language fluently. "N. F. E.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

A position as ASSISTANT BOOKKEEPER or OFFICE and SALESROOM ASSISTANT by a young man who has had experience in the furnace, plumbing and steam and hot water boiler wholesale and retail trade; permanent position desired; satisfactory references can be furnished. "Qualified," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 4

As a local or traveling SALESMAN with a wholesale jobbing house in the plumbing, gas and steam fitting line by January 1, 1898; references as to honesty and ability. "J. A. B.," 156 High street, East, Detroit, Mich. Dec. 4

Steady work by a young man who is a good all around hand at plumbing, tin, sheet iron, iron pipe, cycle and electric bell work; 11 years' experience; steady and sober; wages $2 per day. "J. S.," 311 Franklin street, Bloomfield, N. J. Dec. 4

Special Notices.

WANTED.

A line of Refrigerators as a side line, by a salesman calling on the house furnishing goods trade in New England. Can furnish a sh ipping depot. Address

"REFRIGERATOR,"

office of *The Metal Worker*, 232-238 William St., New York.

WANTED.

Thoroughly good and practical receipts for White Enamel for Cast Iron Bath Tubs. Address, in confidence,

"BATH TUBS,"

office of *The Metal Worker*, 232-238 William St., New York.

For Sale or Exchange.

Full set Tinners' Tools, Machines, Benches, etc. Worth $400, for $200. Will exchange for stamped or pieced tinware, or sheet iron for stove pipe.

PORTSMOUTH TINWARE CO., Portsmouth, Ohio.

FOR SALE.

Stove, Tinware, Plumbing, Spouting and Roofing business in a Central Pennsylvania town of about 2500 population. Invoice $1000 to $1500. Can reduce lower. If sold, must be soon. Address

"S. T. P.,"

office of *The Metal Worker*, 232-238 William Street, New York.

Manufacturers' Agent OR Resident Salesman,

To sell on commission in Western and Southern cities *a very popular and complete line* of goods that is having a very large sale in the East and is sold by *all* house furnishers.

Address, COMPLETE LINE,
Office of *The Metal Worker*, 232 238 William St., New York.

WANTED.

A large manufacturer of Hot Water and Steam Boilers desires correspondence with a manufacturer's agent in Philadelphia who handles lines of goods which are used by Steam Fitters, Plumbers, etc., etc. Address "BOILER MANUFACTURER," Box 1204, office of *The Metal Worker*, 232-238 William St., New York.

FOR SALE.

Stoves, Tinware, Heating and Plumbing. Live manufacturing town Northern Massachusetts. Sales $16,000 to $18,000 a year. Fine Trade. Well established. Partner wishing to retire, must be sold by January 1. Best chance in New England to make a dollar.

"RETIREMENT,"

office of *The Metal Worker*, 232-238 William St., New York.

FOR SALE,

Cheap, to close Estate. A set of Tinners' Tools, including Squaring Shears. As a whole, or separate pieces, to suit buyer.

MRS. E. TOBEY,
Suffield, Conn.

FOR SALE.

A good clean, well assorted stock of Hardware, with Plumbing and Tin Shop connected and commanding the best trade in town. Competition consists of one other hardware store. Located in Central New York State in a town of about 7500 inhabitants, having the trunk lines of railroad, paved streets, electric lights, electric street cars, water works, good schools, etc. Stock and fixtures will invoice between $7000 and $8000. Annual sales average about $25,000. This is a rare chance for a cash buyer. Address "RARE CHANCE," office of *The Metal Worker*, 232-238 William St., N. Y.

For Sale.

The Stock, Tools and Machinery of a sheet iron business. Also stock of Heaters, Ranges, and Household Goods in the store. This business is located on the principal business avenue of the city and is being sold on account of the death of the proprietor. For further particulars address or apply to

HENRY S. BEAVER, Manager of
William F. Beaver Estate,
13 West 3rd Street, Chester, Pa.

Special Notices.

Stove AND Steel Range Manufactory

Located at MUNCIE, IND.,

To be Sold at Public Sale.

The stockholders of the JOSEPH BELL STOVE & RANGE COMPANY have passed an order to sell their plant and equipment and stocks of material and manufactured stock at public sale, on Wednesday, the 5th of January, 1898, on the grounds of the company at MUNCIE, IND.

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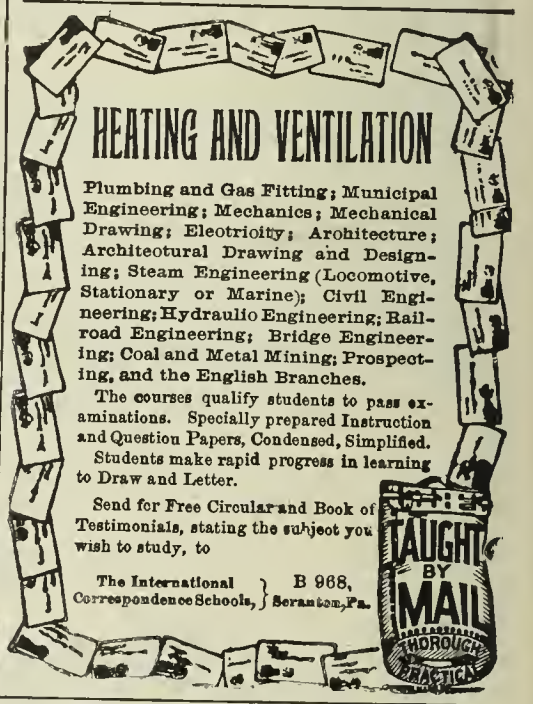
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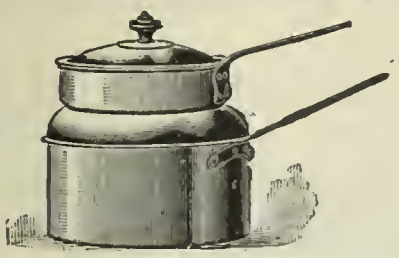

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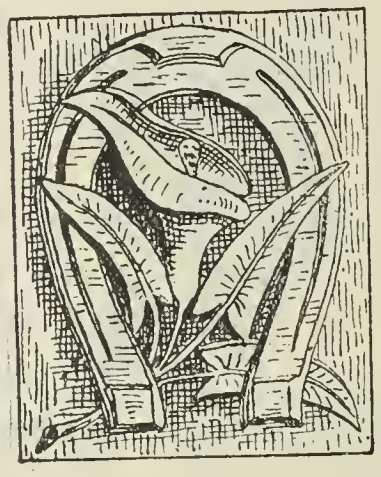

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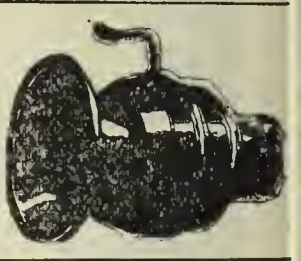

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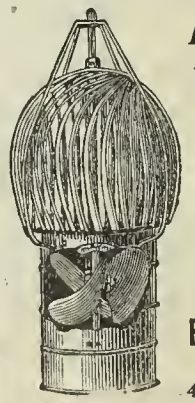

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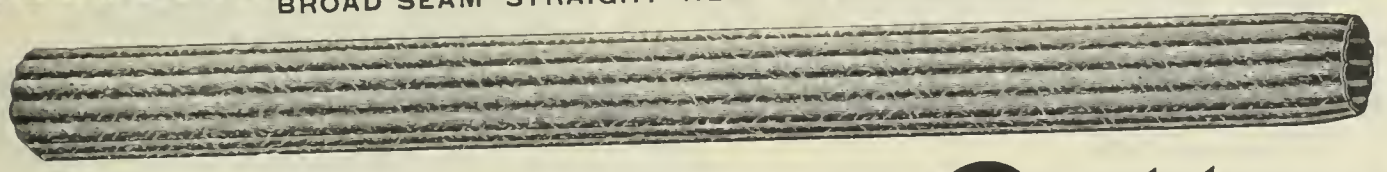

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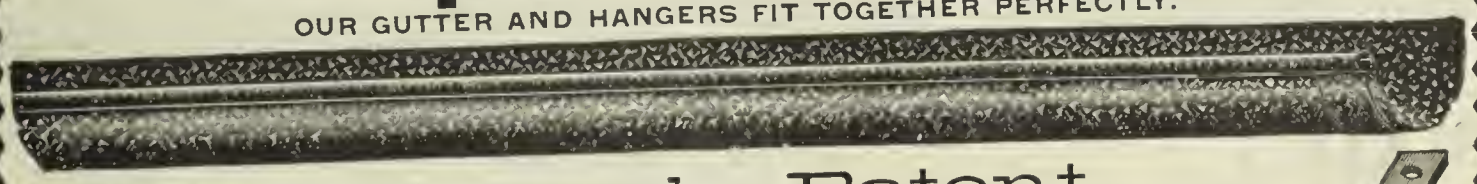

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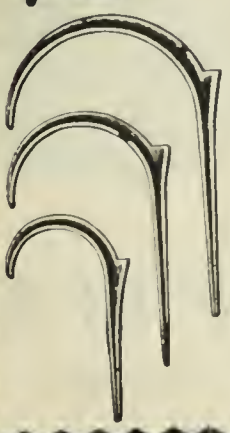

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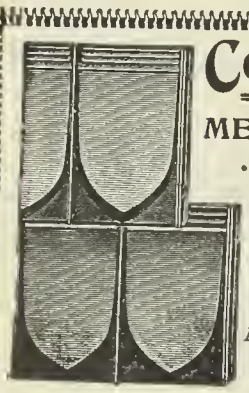

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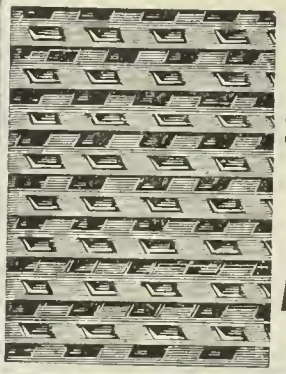

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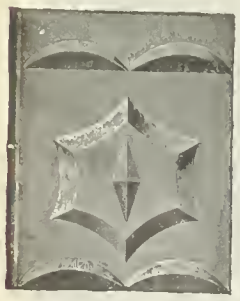

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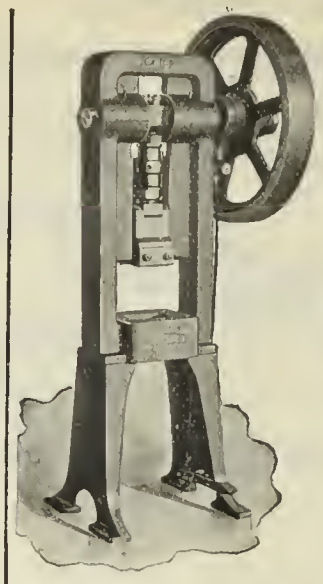

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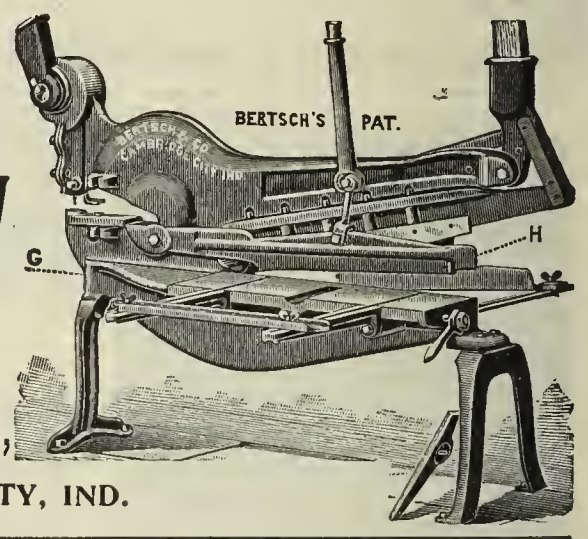

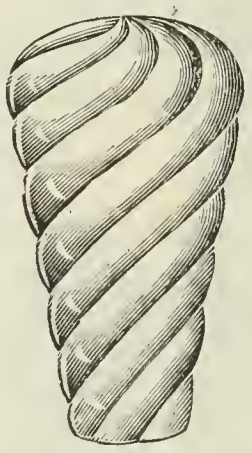

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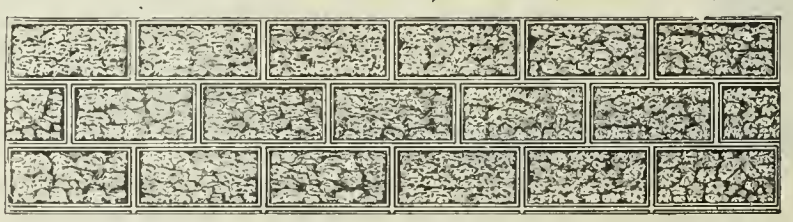

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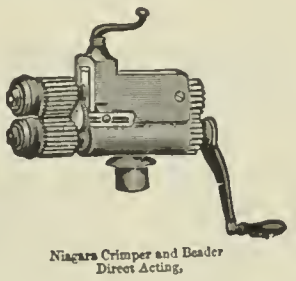

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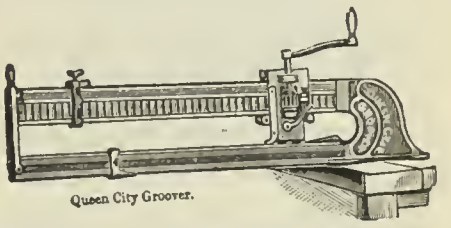

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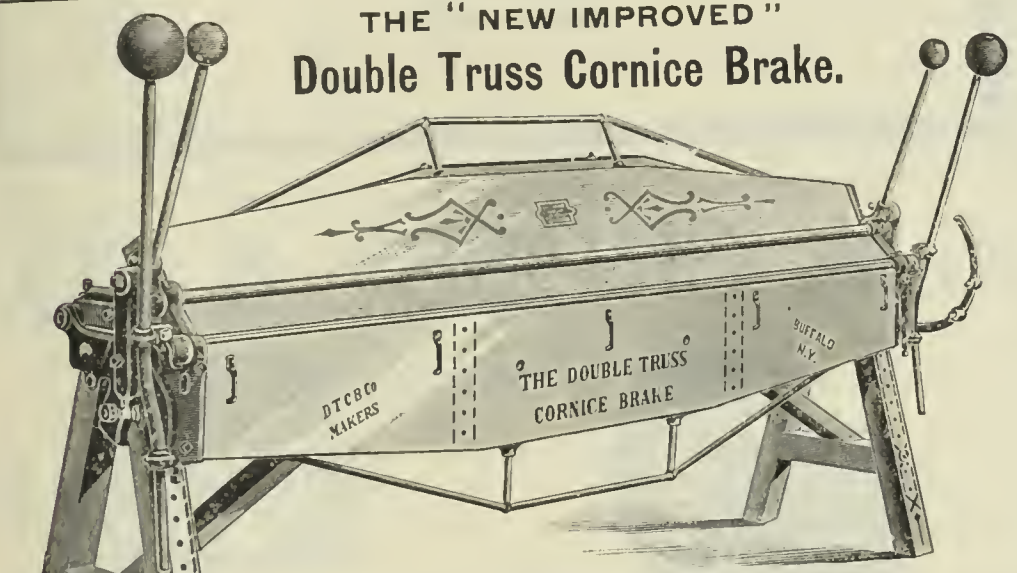

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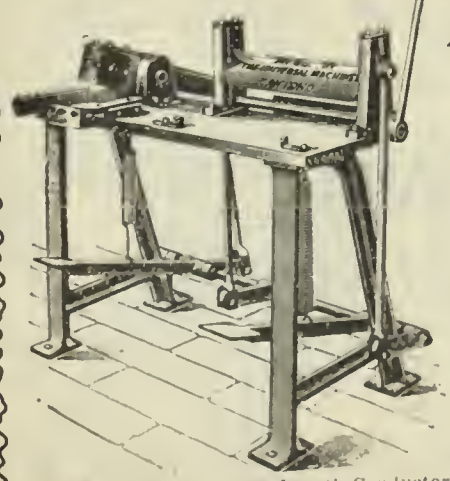

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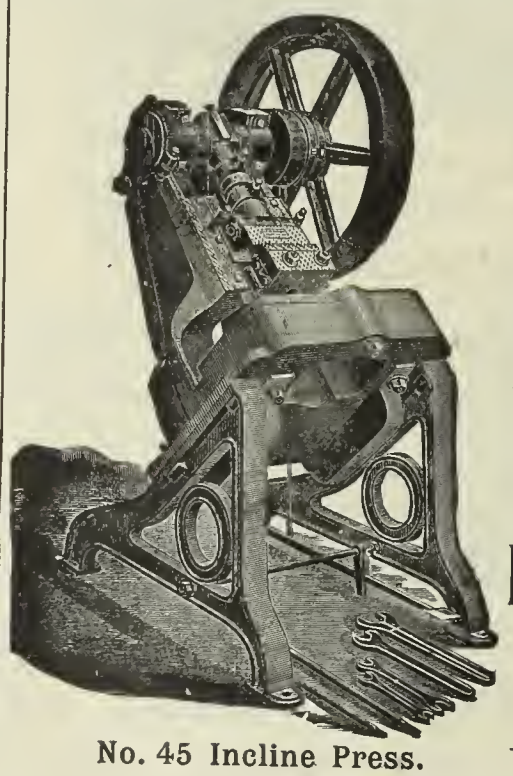

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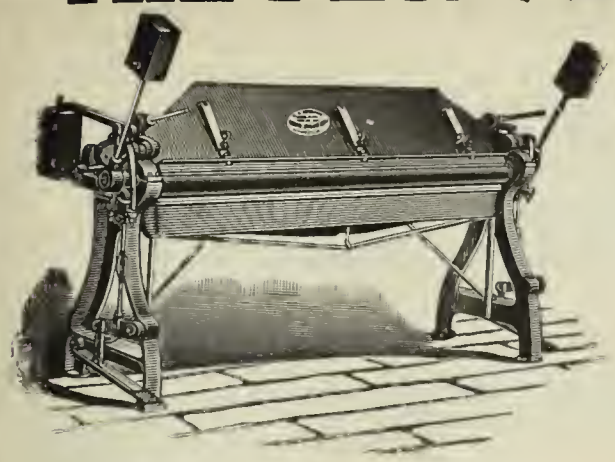

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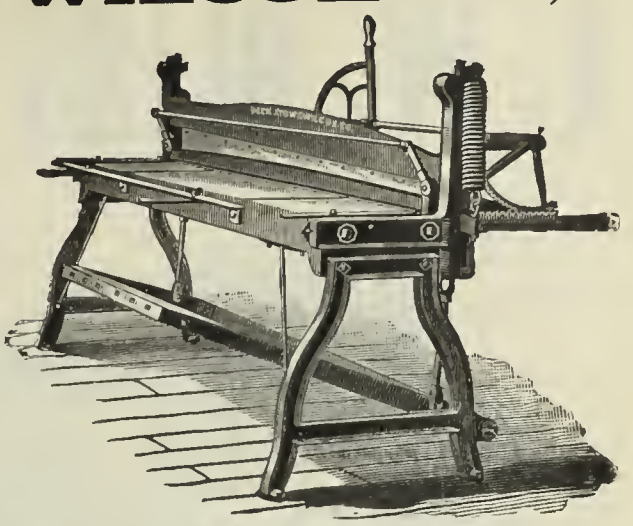

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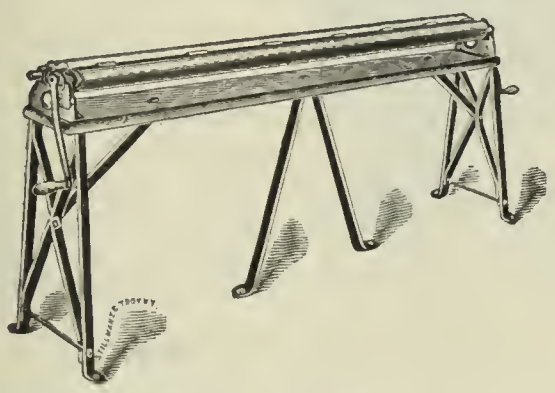

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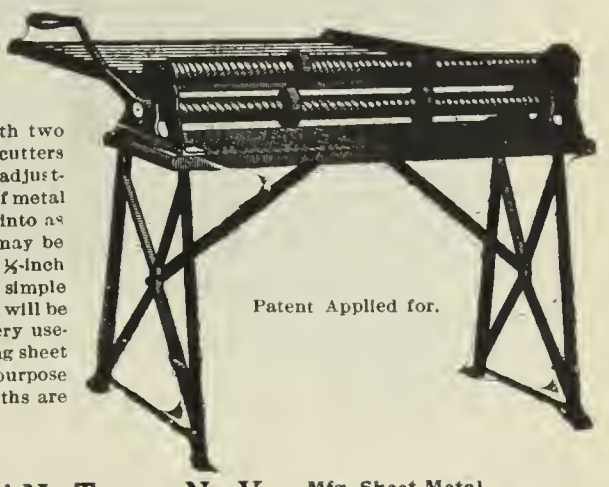

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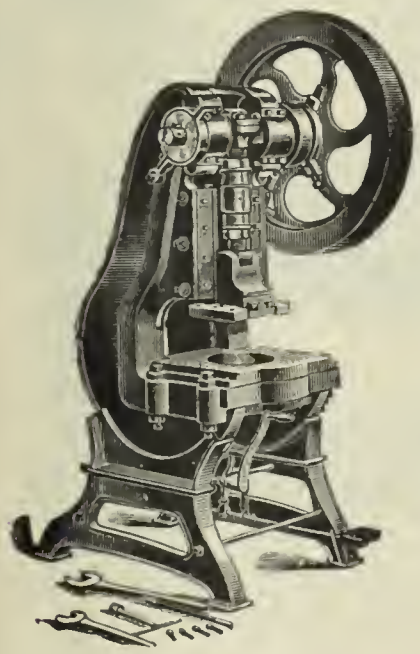

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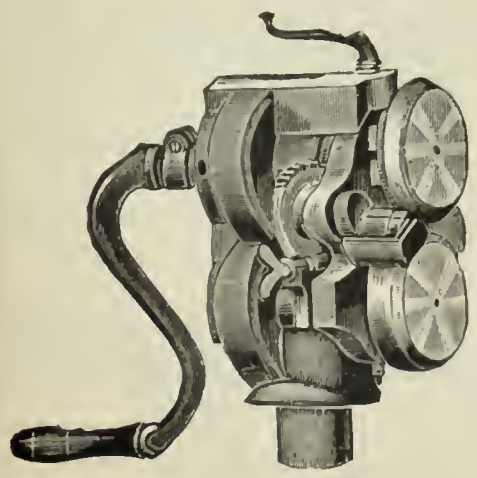

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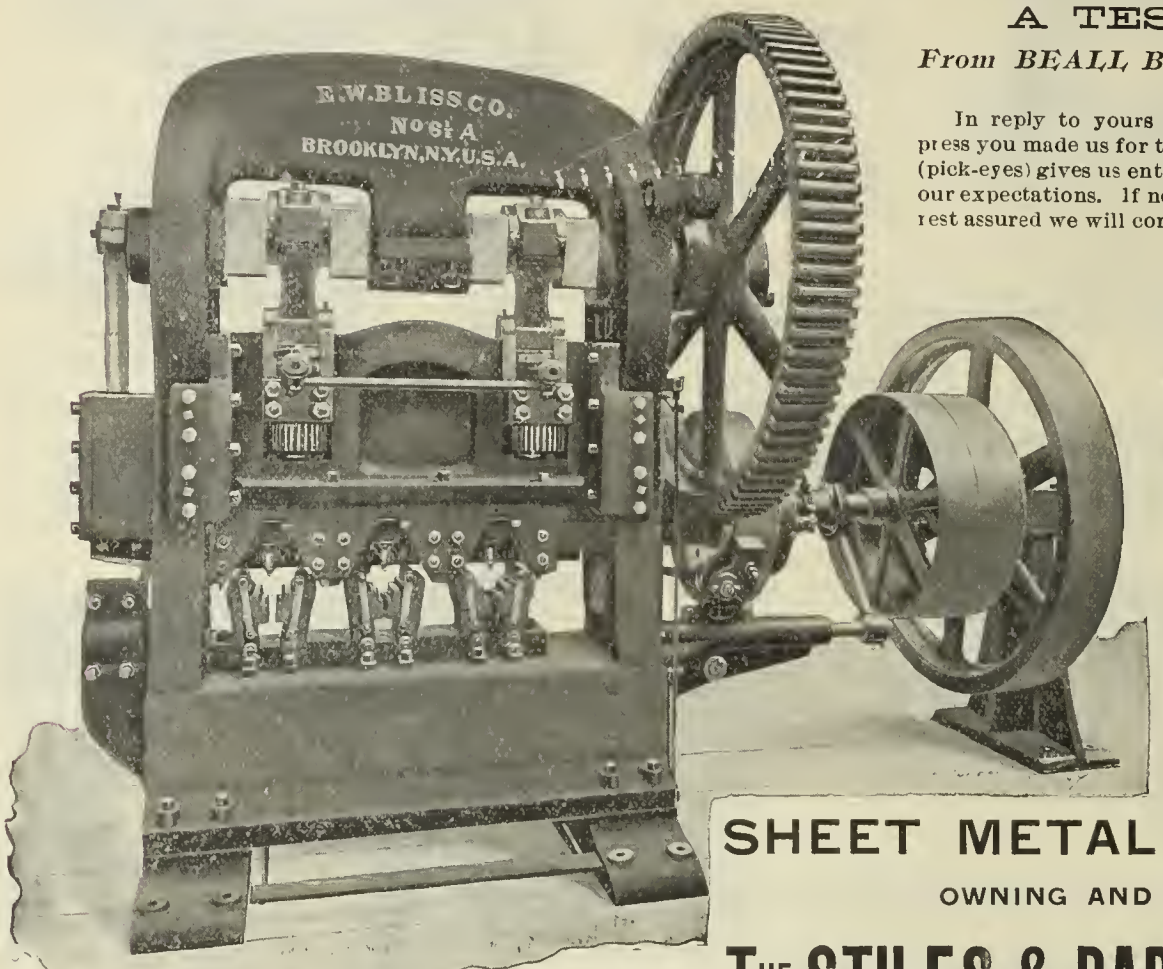

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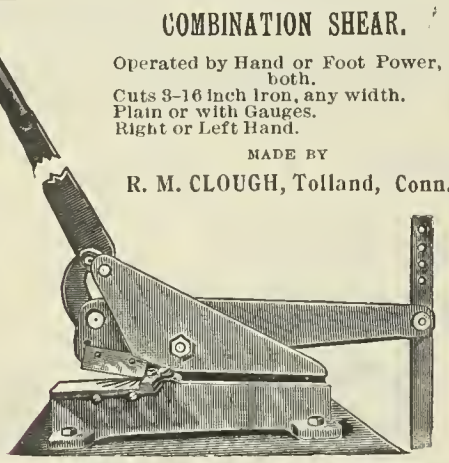

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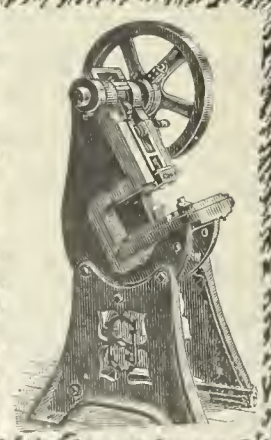

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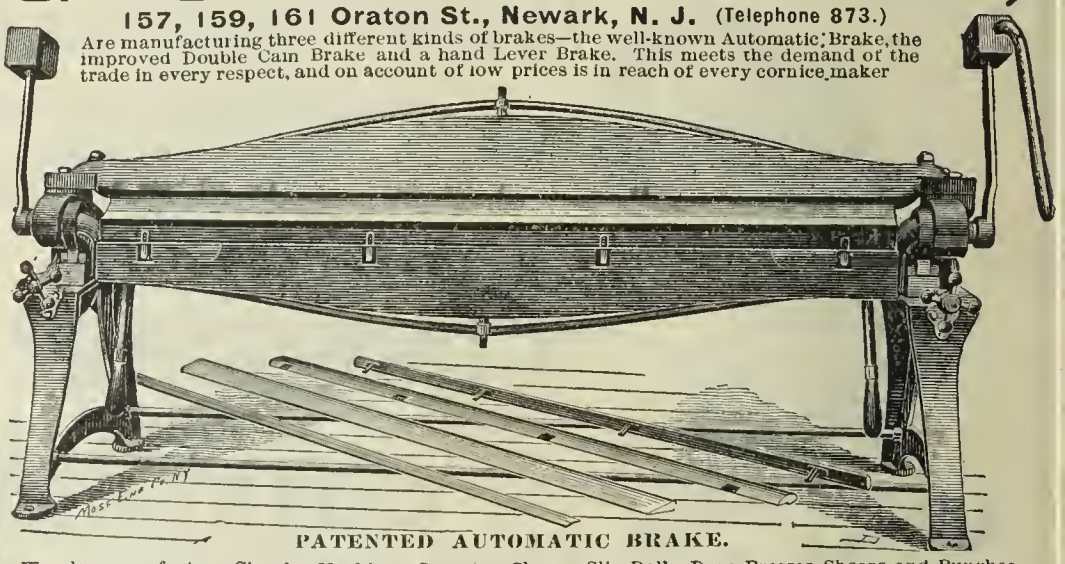

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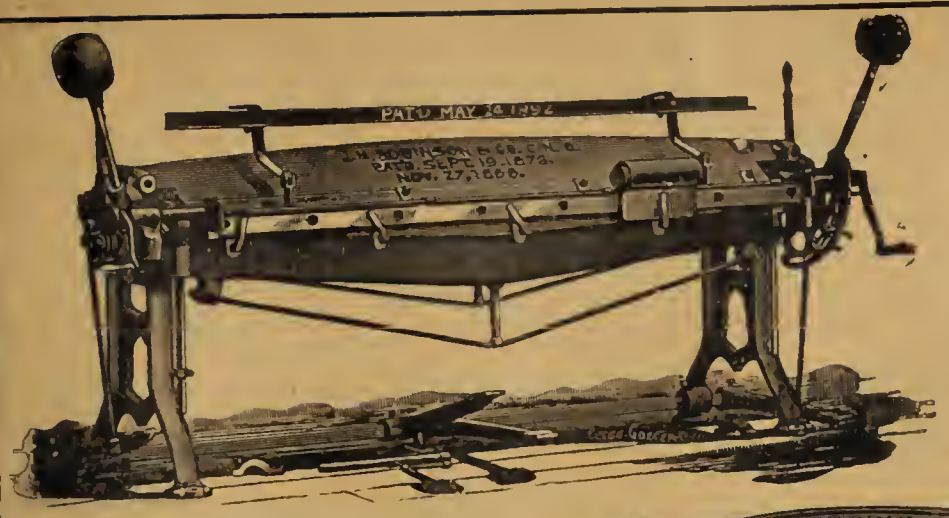
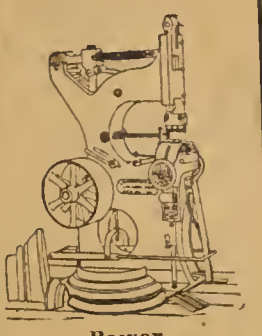


Roofing Machine.

With Dies suitable, will form Sheet Metal Roofing, Siding, Ceiling, Weather-Boarding, Skylight Bars, Metal Lathing, Gutters, Ridge Caps, Escalloped Steel Sheets and Cattle Troughs.



Power.

CURVED MOULDING MACHINE.

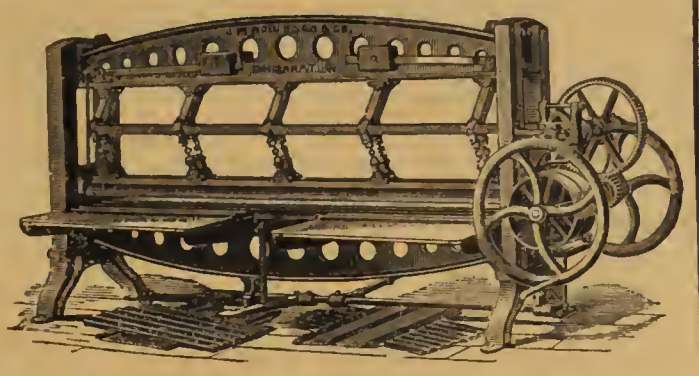
Every style of Sheet Metal Curved Mouldings produced on this Machine with ease and dispatch.

THE "GLOBE" CORNICE BRAKE.

With which to form Sheet Metal into Cornice Mouldings, Ridge Caps, Skylight Bars; and with Beader and Gutter Former attached to Brake (price of which is extra), Bead and Form Gutters. Cornice manufacturers' Steel Straight Edges, 30-inch to 10-foot lengths.

Cornice Mouldings, true and straight, are formed with ease and speed on the above illustrated 8-foot Cornice Brake, which brake is made of cast and wrought iron and steel, many of which have stood the test of twenty-seven years and more, and are good for several years to come.

High Grade Cornice Brakes—try them, and save your strength, time and money.



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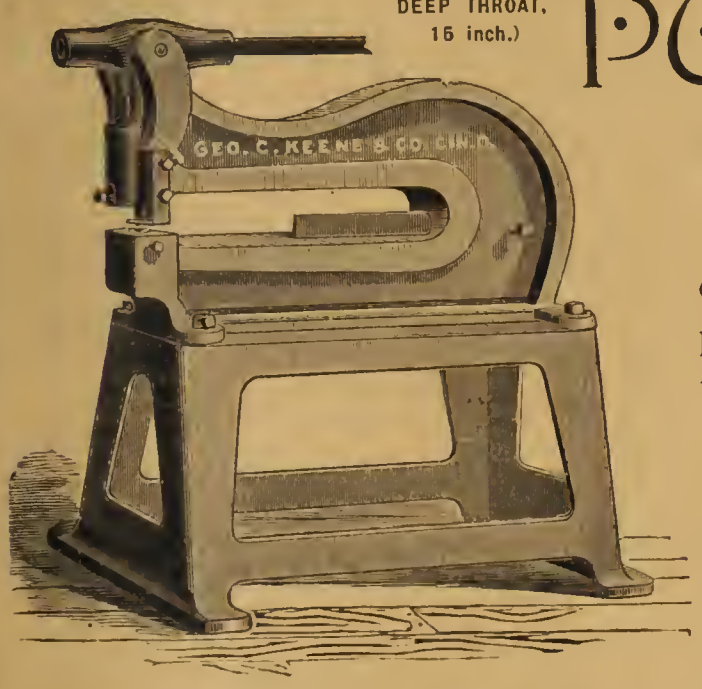
SHEET METAL TOOLS ALL KINDS.

Presses, Dies, and Special Machinery.

ADRIANCE MACHINE WORKS, 169 Plymouth Street, Brooklyn, N. Y.



DEEP THROAT, 16 inch.)

PUNCH.

Double Action.

Strong, easy of operation, cheap. Will punch ¼ inch hole through No. 10 iron or steel and lighter.

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MINER & PECK MFG. CO.,
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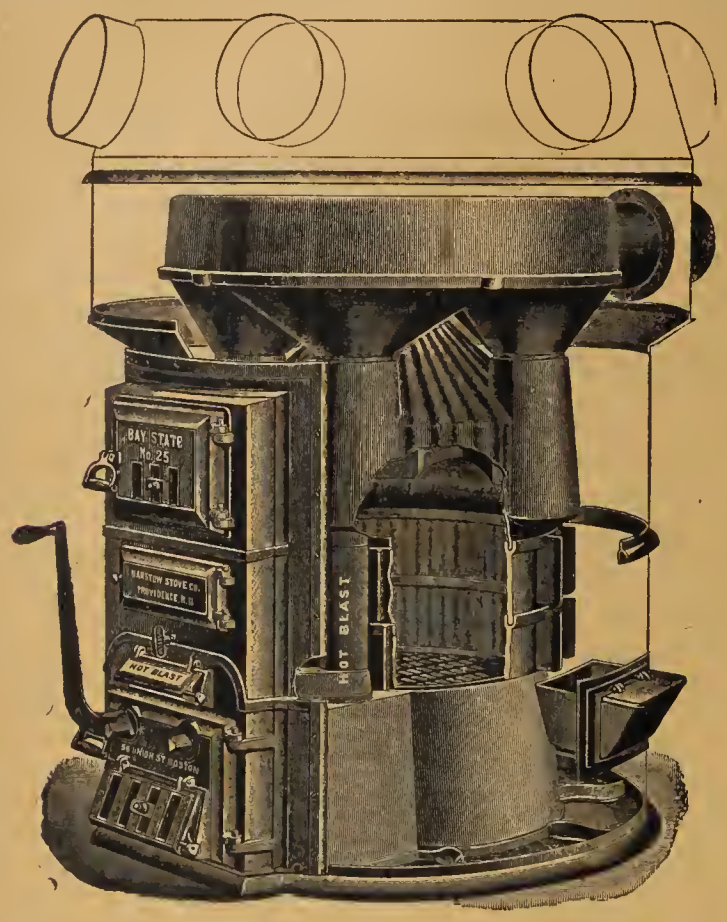
—'PAPA, how do the people in the Weather Bureau find out what kind of weather we are going to have?" "I didn't know that they did, my son."—*Yonkers Statesman.*

FIN DE SIECLE.

She smoked one dainty cigarette;
No one was nigh, the hour was late.
Next day she felt, to her regret,
That everything was up to date.
—*Chicago Times-Herald.*

NEW 1897
Bay State Furnace.



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N. & G. TAYLOR CO.'S
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Roofing Tin
On
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The wear is the true test of value.

This brand of Tin was selected by the U. S. Government over all Competitors.

The trade will recall that another brand was used for this roof only a few years ago.

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Dealers in all kinds of Scrap Iron and Steel.

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CAST IRON PIPE and SPECIALS for WATER and GAS. Also Flange Pipe and Fittings, Hydrants, Gates, Pig Lead, etc. CHAS. MILLAR & SON, Selling Agent Utica, N. Y. Manufacturers of Lead Pipe and Plumbers' Materials. Wholesale Easter Agents Akron Vitrified Sewer Pipe.

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Sole Manufacturers of Woods Smooth Iron
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Good Judgment

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That man should handle the

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We have the following sizes in stock :

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IC & IX, 20 x 35¾, " 11 in. "
IX, 20 x 39, " 12 in. "
"Cupola" Brand.

Superior quality and finish. We invite correspondence before buying.

McCLURE & CO.,

PHILADELPHIA, 115 North 7th St.
PITTSBURG, PA., 211–213–215 Second Ave.

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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. XLVIII. NUMBER 25

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You Want the Best. We Have It.

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Takes less time to do a job.

Return to your jobber at his expense any sheet or part of a sheet that develops in working any defect whatever.

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We furnish these tested to 200 pounds and guaranteed against collapse, and for use under heavy pressure. They cost a little more than iron, but are not only more durable but have a value as old copper which is a handsome percentage of cost.

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with Drip-pipe Connections insure perfect circulation. You are not annoyed with escaping steam or dripping of water. They are stamped with our Trade-Mark.

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For 1898 the "Quick Meal" Blue Flame Oil Stove has embodied in it all the special and valuable features found therein during last season, and a good many have been added thereto, while all points subject to improvement have been carefully looked into and made perfect. The Tank is made of Brass and composed of only two pieces, jointed with a single seam, which makes it leak-proof. The ends of the Tank (the parts which show) are polished—one of the Drums of each Burner is also constructed of polished Brass. The Wick-raising device is the simplest and most reliable.

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ST. LOUIS.

P. S. The Quick Meal Steel Range is a winner It looks well, it cooks well, it bakes well, it sells well, IT SATISFIES well. There is none BETTER.

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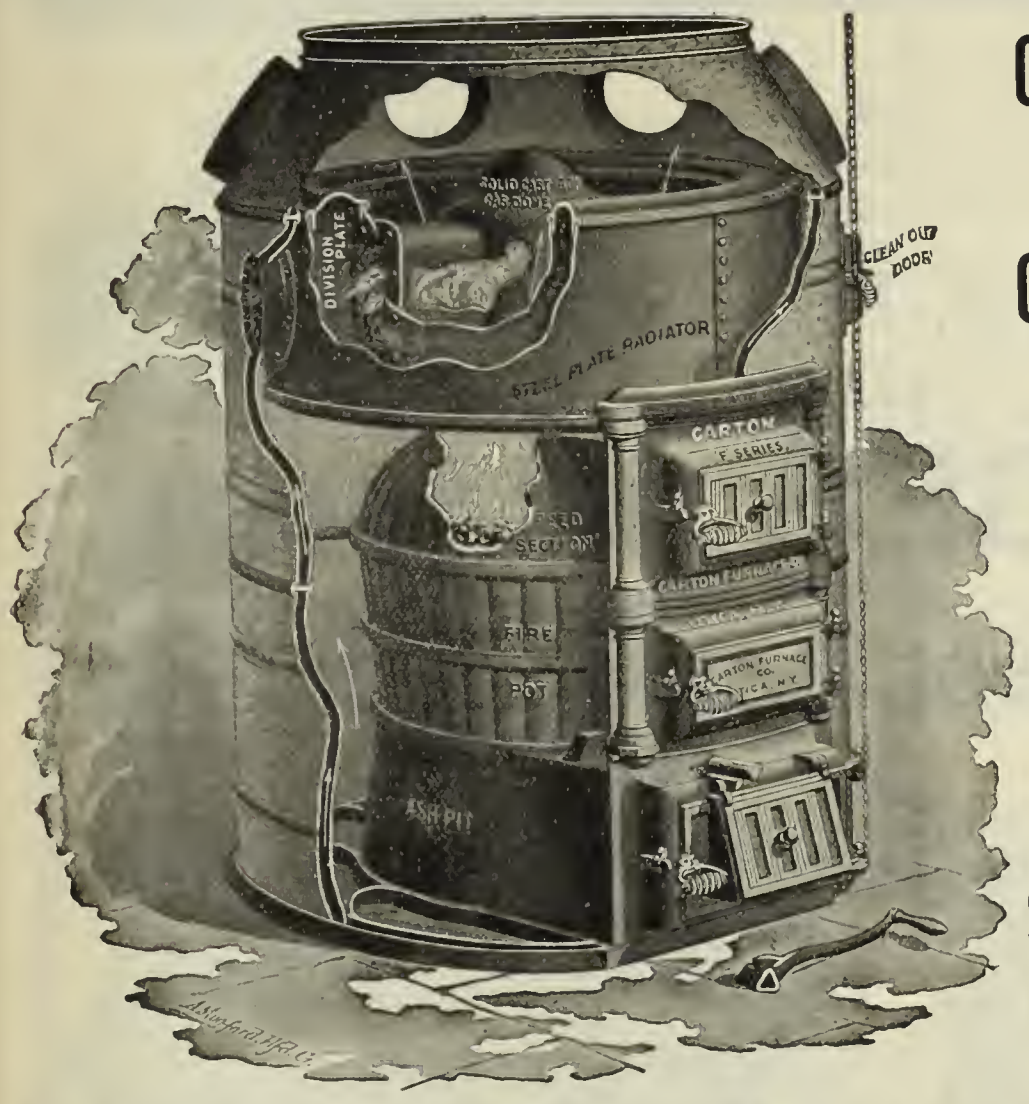

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All CAST iron and large GAS MIXING Chamber.

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Gas-Tight RADIATOR.

SUPERIOR construction.

ELEGANT shield FRONT.

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If Interested In Steam and Water Boilers—we make a most complete, line and you should send for our New Boiler Catalogue and Prices.

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Makers of Heating Apparatus for the past *50 Years,*

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Warm Air Furnaces (Thirteen Patterns).

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ECONOMY Heaters & Furnaces

FOR Hard Coal, Soft Coal, Lignite, Coke or Wood.

Before selecting a line of apparatus to sell in 1898 ask for our prices and Catalogue—we can interest you.

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PACIFIC RANGES Are Best

BECAUSE

They're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.

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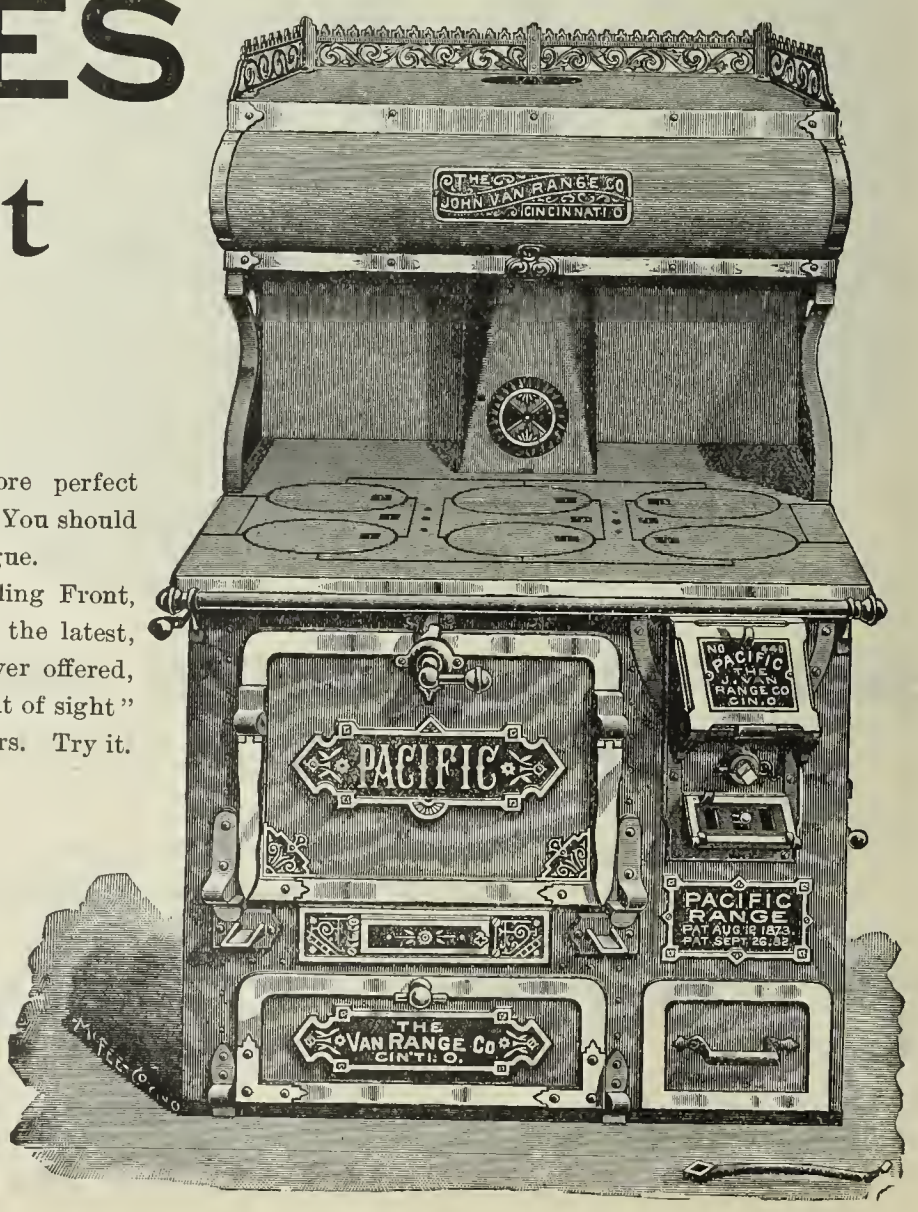
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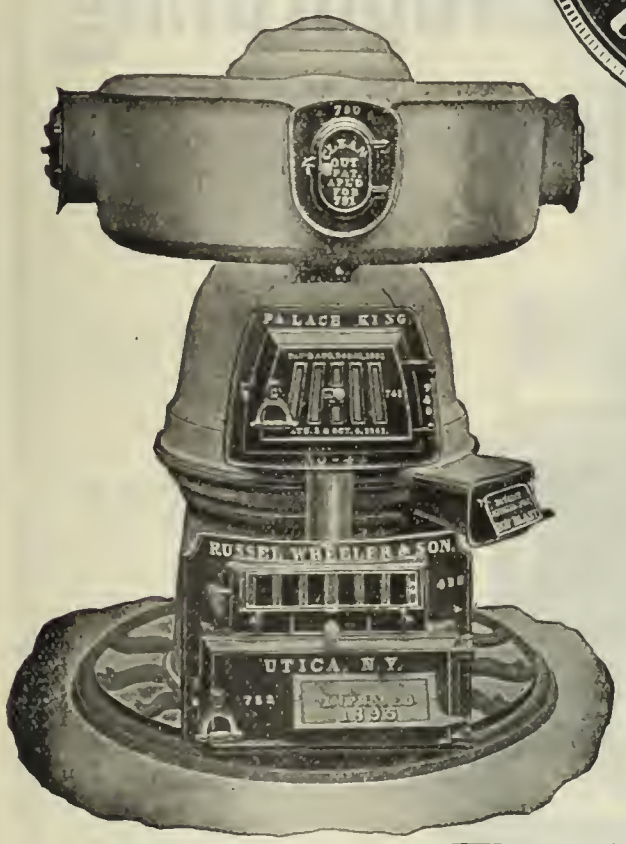

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CHRISTMAS.

We can't do much with the weather, but we can always keep your house warm, and that's really the most important part.

If you want to look over a handsome piece of work, write for our catalogue—Hot Air, Hot Water, or Steam.

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Very truly,
I. N. EVANS.

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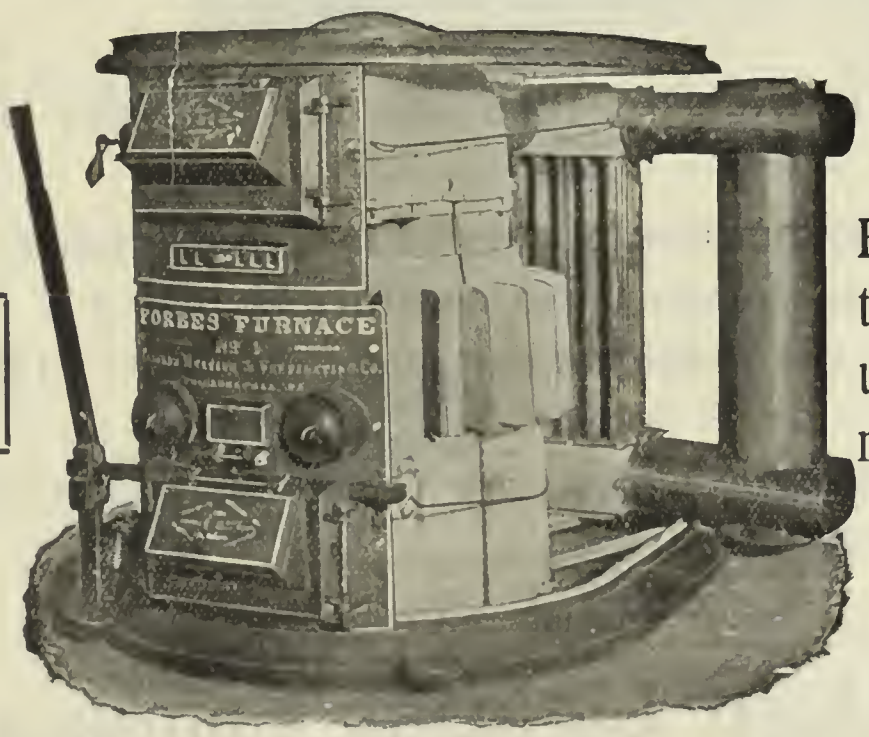

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HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ **Only 4 ft. 3 in. High in the Largest Sizes.**

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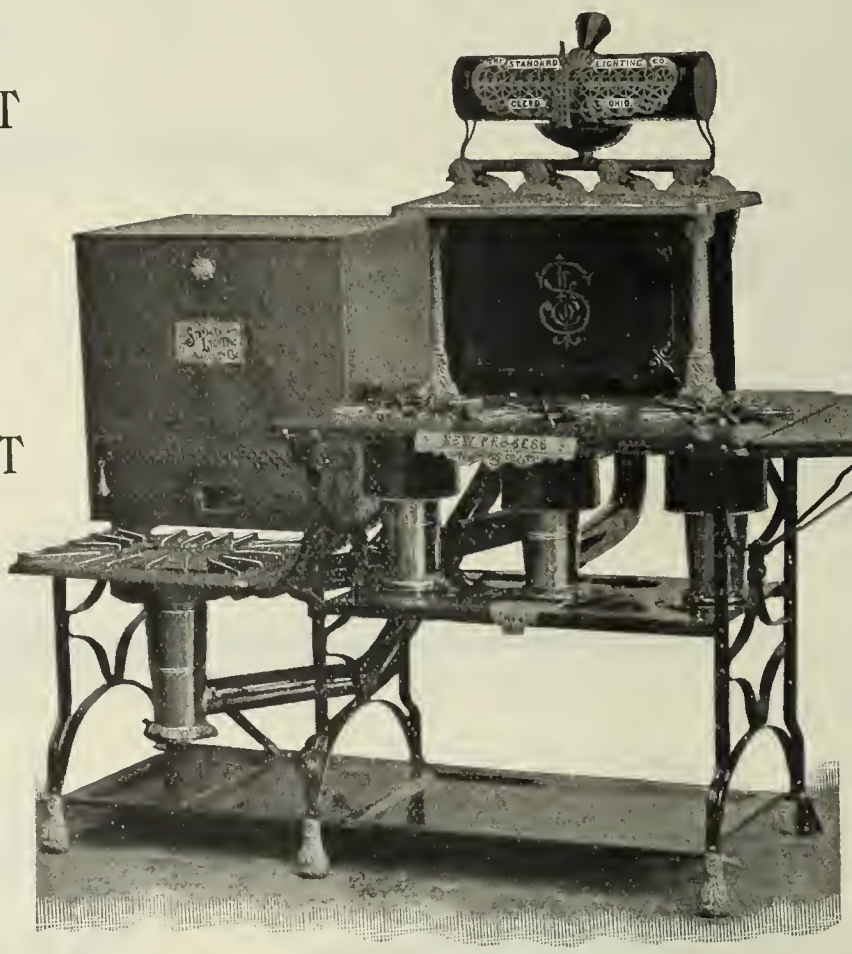
A STOVE THAT LIGHTS LIKE GAS.

A STOVE THAT IS PERFECT IN EVERY DETAIL.



A STOVE THAT IS ABSOLUTELY SAFE.

No Drip Cup to Overflow and cause trouble.

RESERVOIR CANNOT BE FILLED WHILE THE BURNERS ARE LIGHTED.

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Why have the housewife swelter in a hot kitchen, carry coal and ashes when she can have *comfort* by using a "NEW PROCESS" Stove—the *handsomest* piece of stove furniture made?

Send for Catalogue and secure the agency early.

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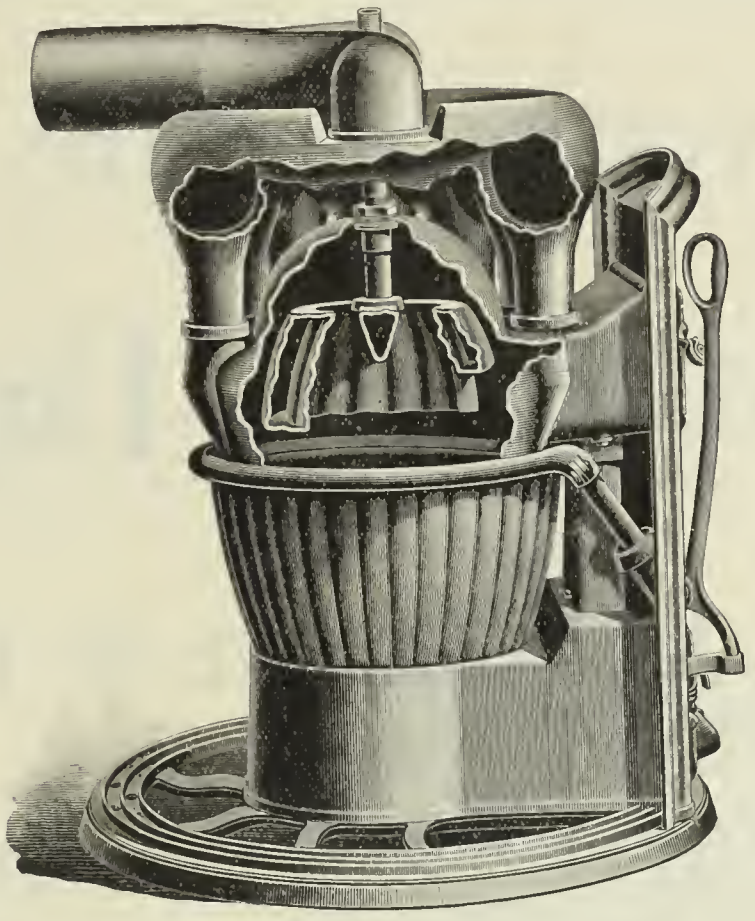
WITH GAS-FLAME FLUE.



COMBINATION HEATER.

In the above cut the castings are broken away to show the position and shape of the water heating section.

The water section is made in three sizes, and large or small water section can be used in same size of furnace.

STAMFORD FOUNDRY COMPANY,

STAMFORD, CONN.

Send for catalog showing full line of Ranges, Stoves for various purposes, and Furnaces.

Richmond RANGES

THE DEALER

Wishing to Supply only the Best should Acquaint Himself with

THESE PRODUCTIONS.

ECONOMICAL,
DURABLE AND EFFICIENT.

A REPUTATION OF THIRTY YEARS.

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Have you secured the agency of

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Oak Stove in the Worl

Heating capacity one and one-

greater than any direct-draft Oak

A genuine a

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The Michigan St

Largest Makers of St
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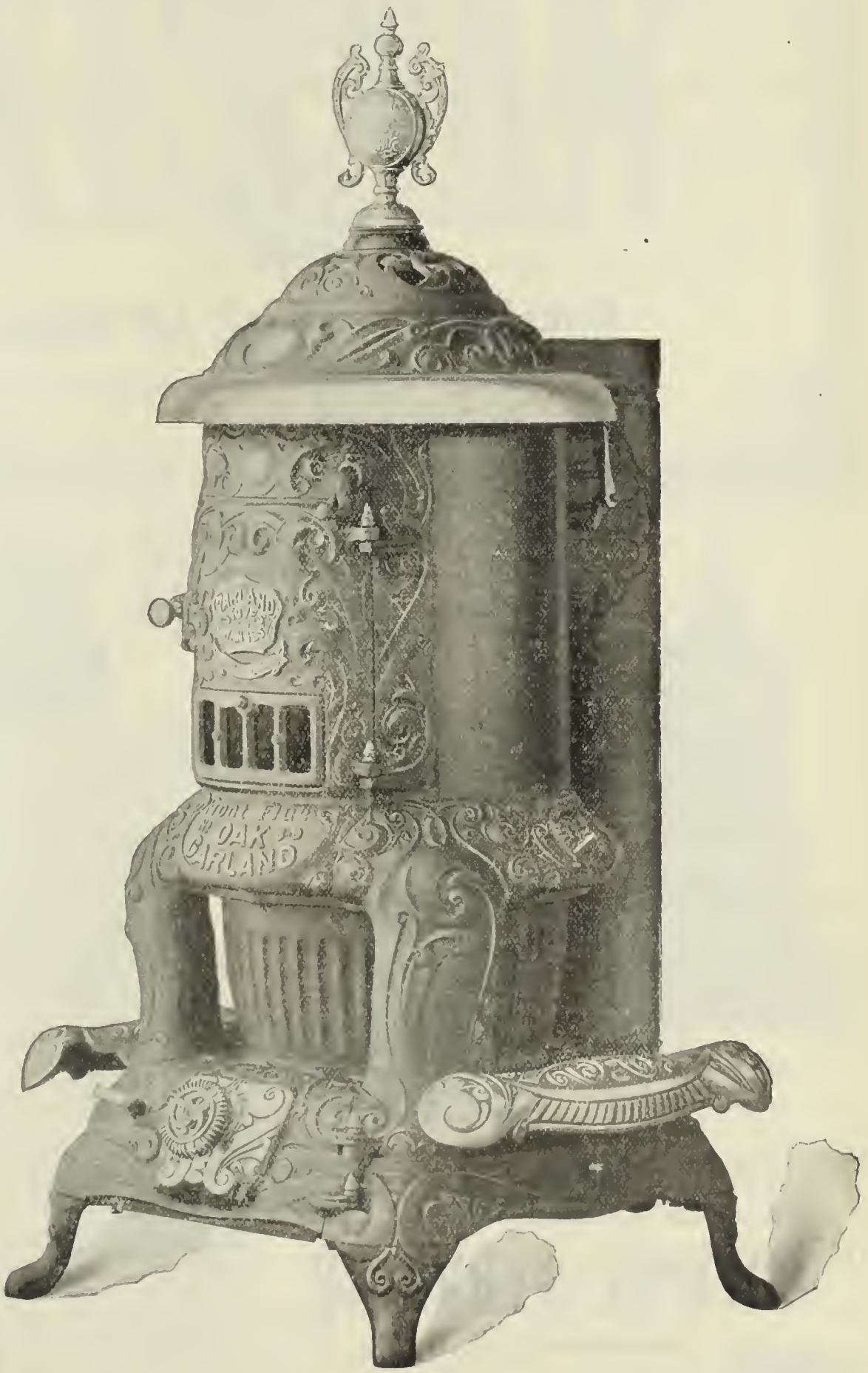

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Sold on their Merits, not on their Antiquity.

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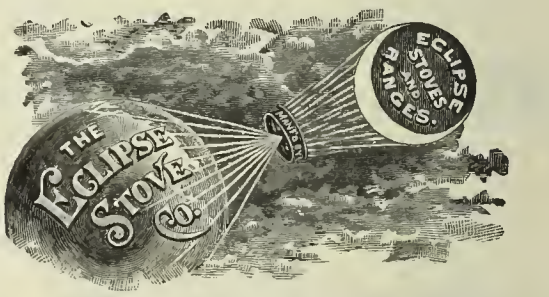

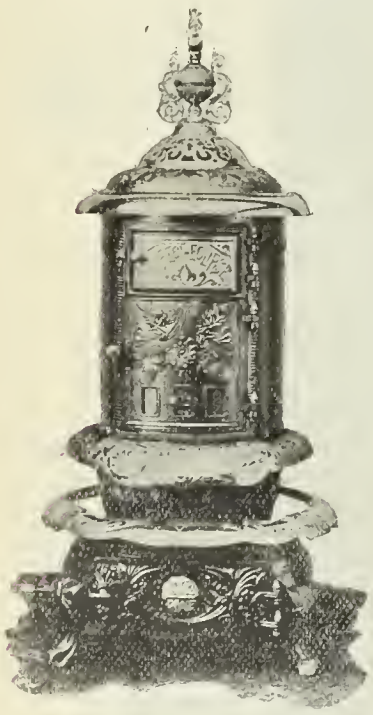

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4 Sizes.
14—16—18—20 in.

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CARBON ECLIPSE.
Air-Tight.
Sizes: 13 in., 15 in., 17 in.

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Sheet-Iron Air-Tight.
Sizes: 24 in., 28 in.

Two First-Class Oaks.

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HARD COAL. SOFT COAL. NATURAL GAS.

CASINGS: 28 to 62 Inches.

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The most complete assortment ever offered a dealer.

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Well Mounted.

Perfect Castings.

Honest Values.

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Boomer Steel Range

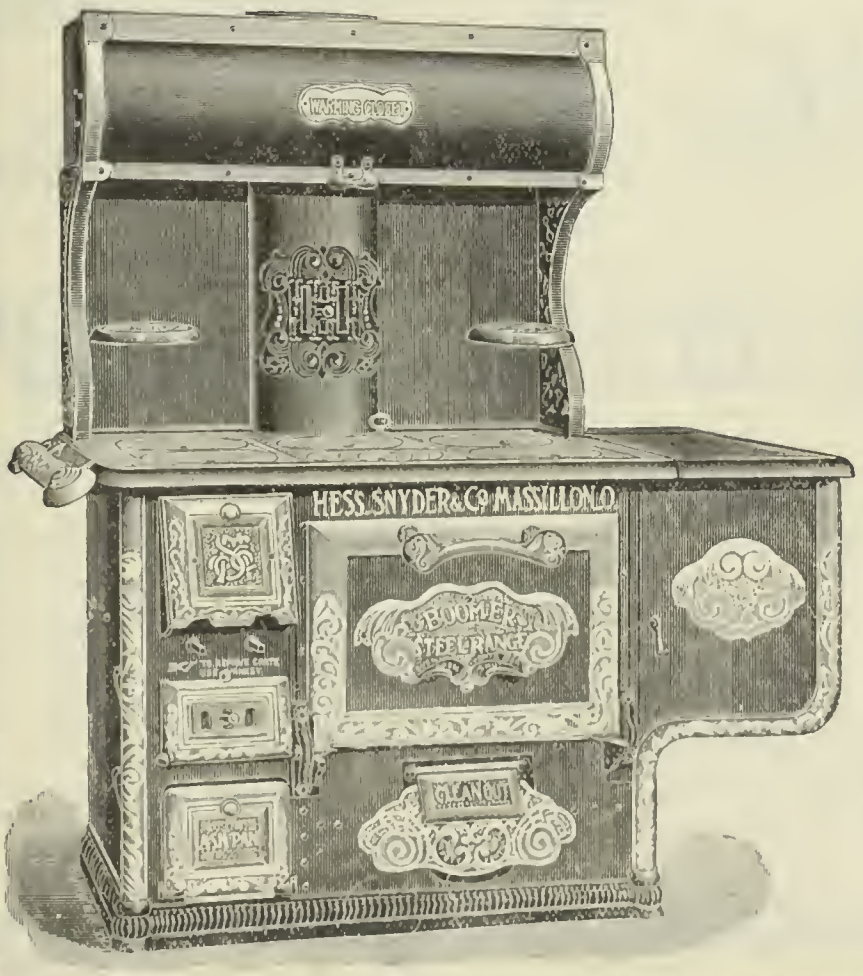
WITH

High Closet,

Rolling Front,

Six Holes,

Stationary or Portable Reservoir.



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When you want a good furnace don't forget the CELEBRATED BOOMER.

HESS, SNYDER & CO.,

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JUST THIN

A Gasolene Stove that is safe
A Gasolene Stove without nee
A Gasolene Stove that can be
BURN

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A Stove on which all burners
A Stove that can be left burni
A Stove that will work in cold

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It's the result of five years' pa
The finest stove made for Fa

It's absolut

GEORGE M. CLARK & COMPAN

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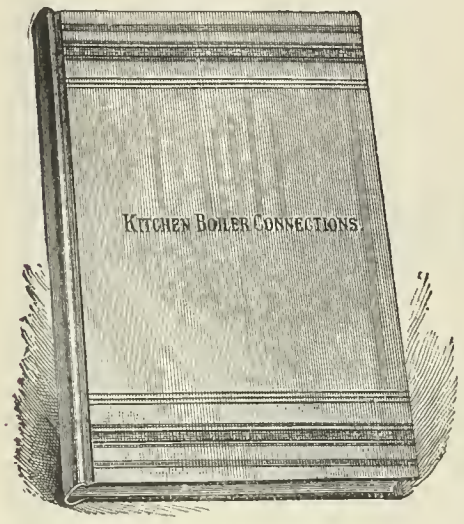

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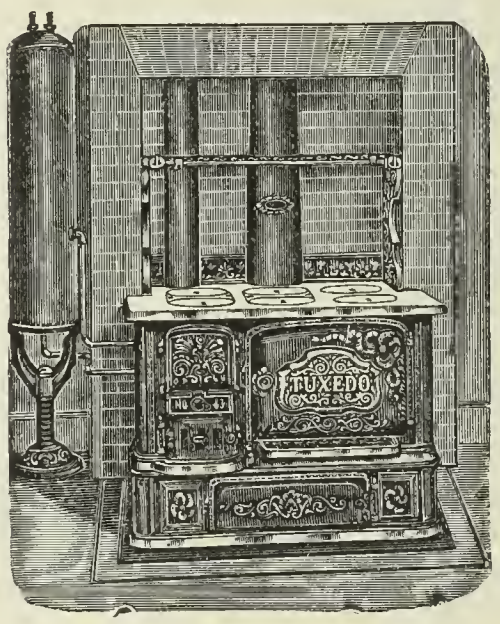

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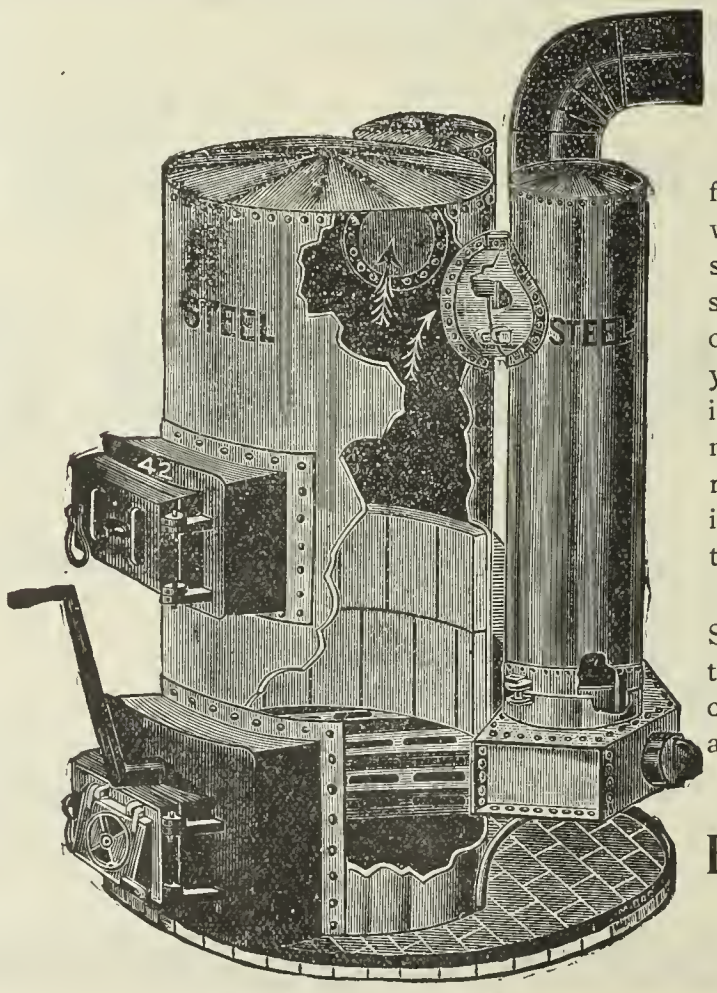

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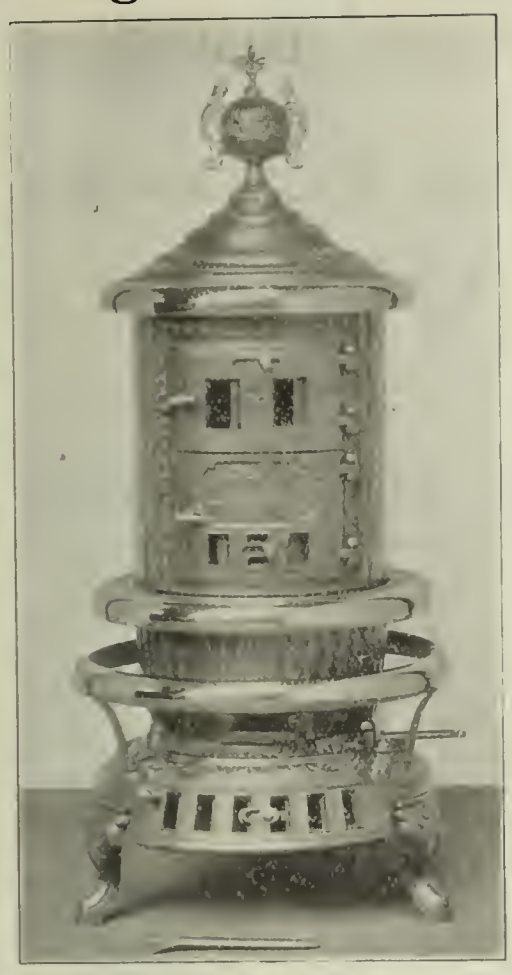

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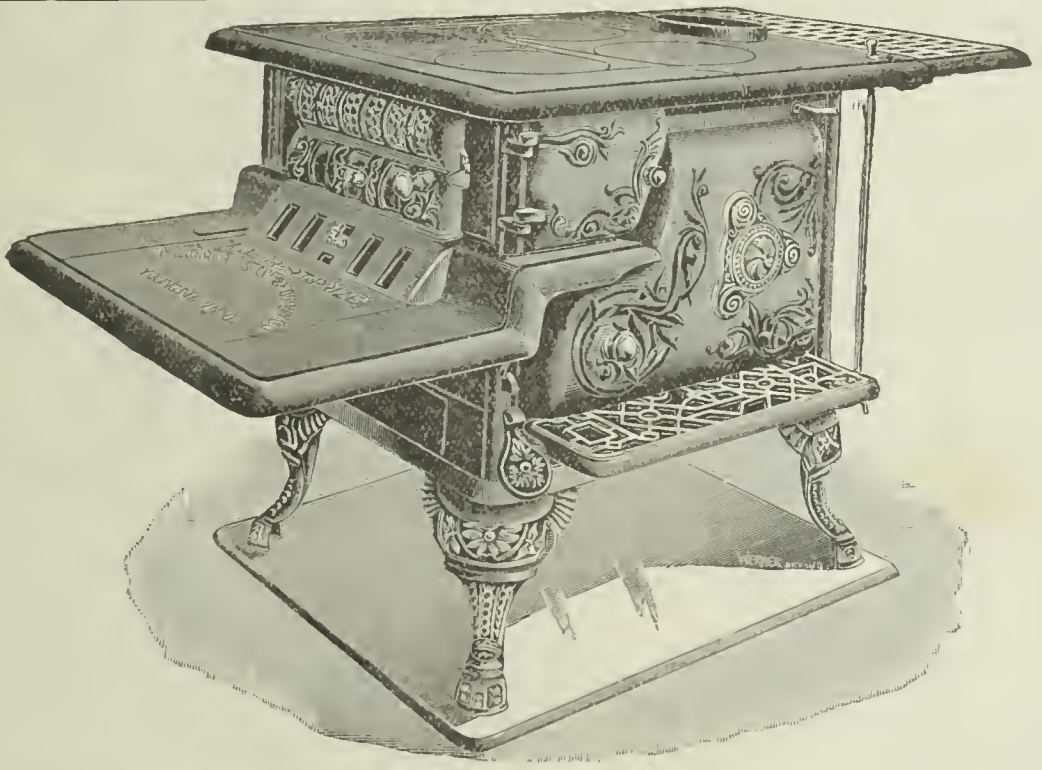

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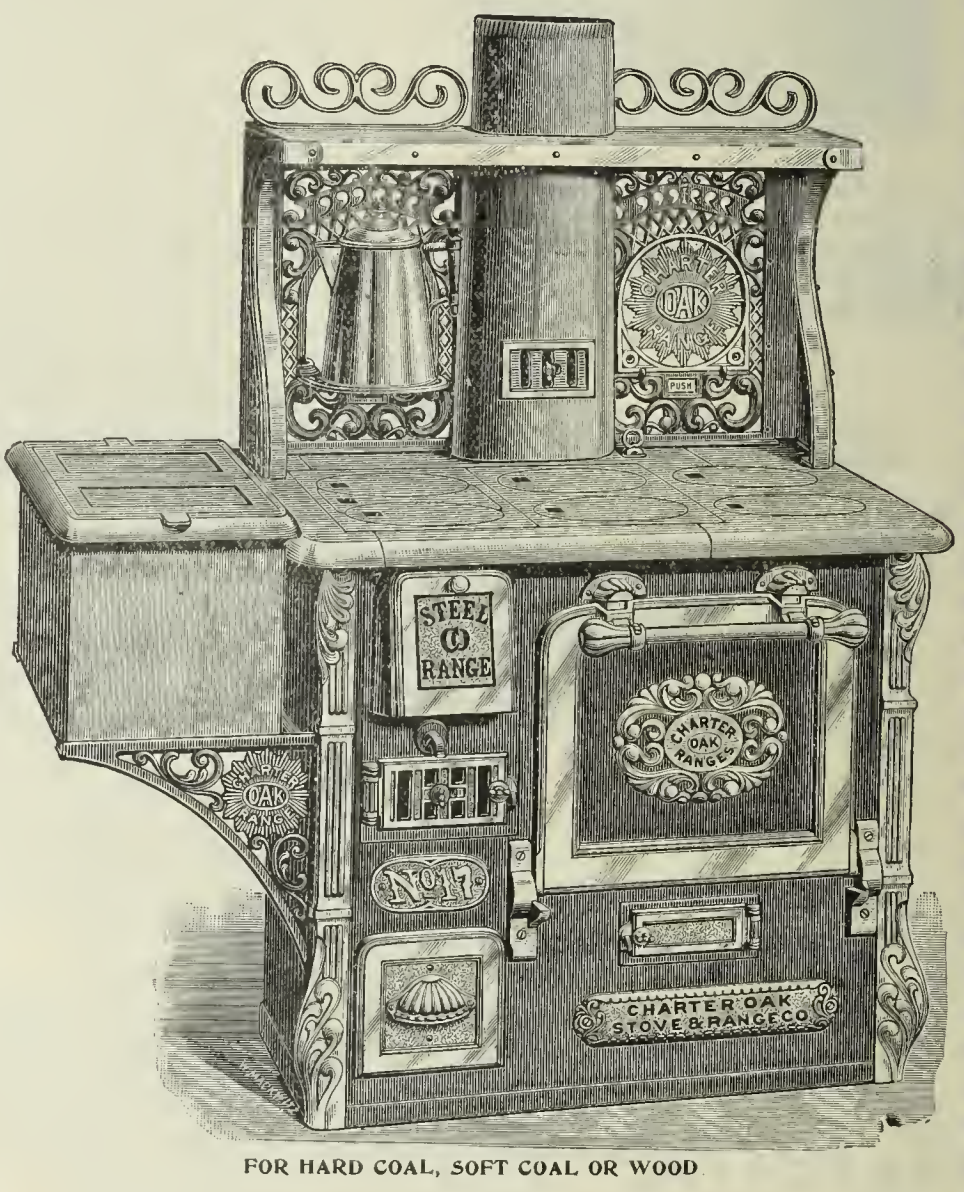

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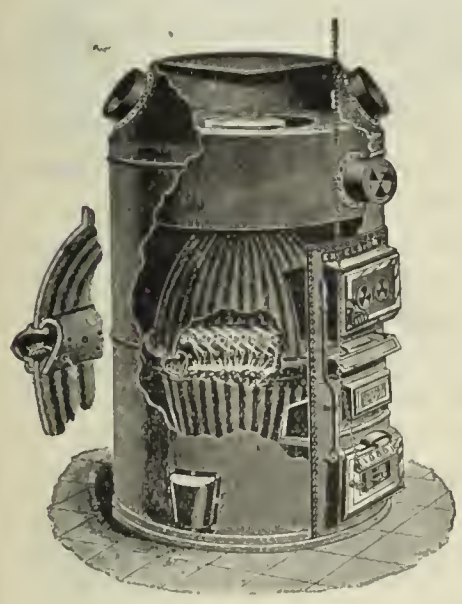

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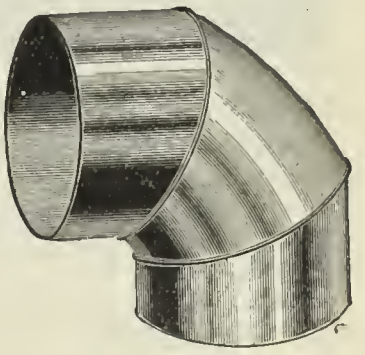

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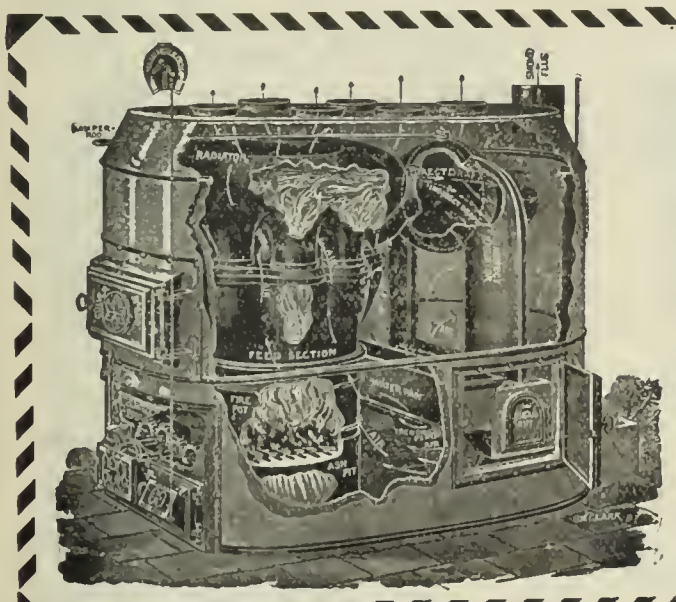

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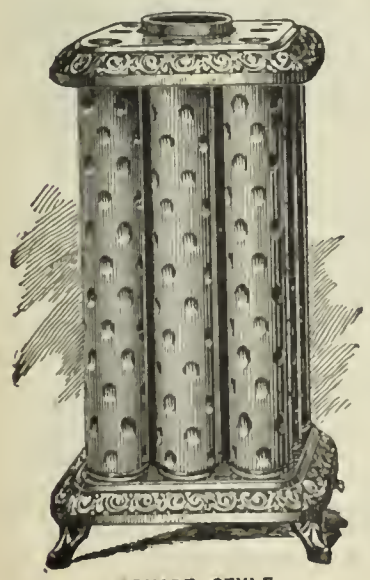

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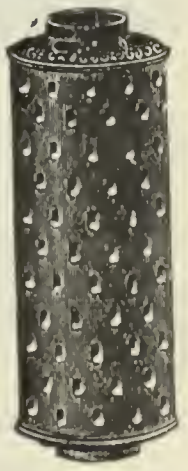

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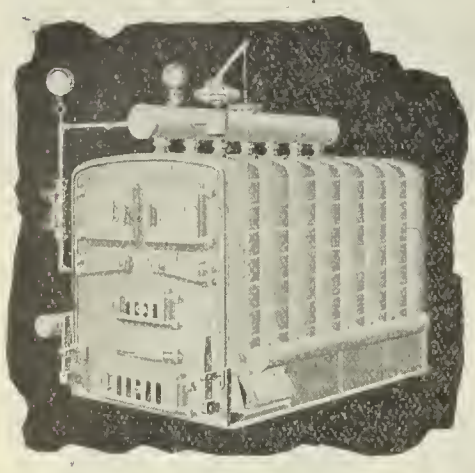

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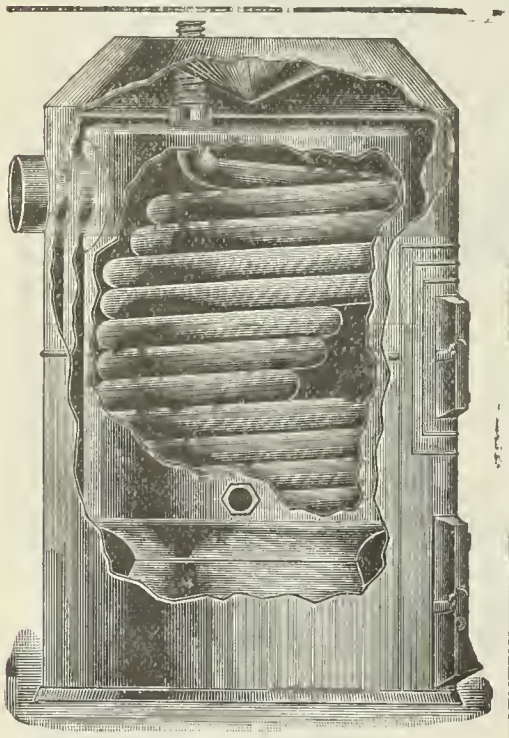

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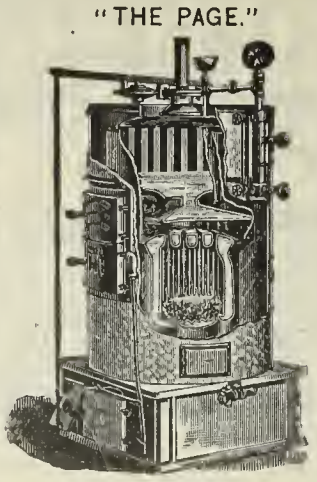

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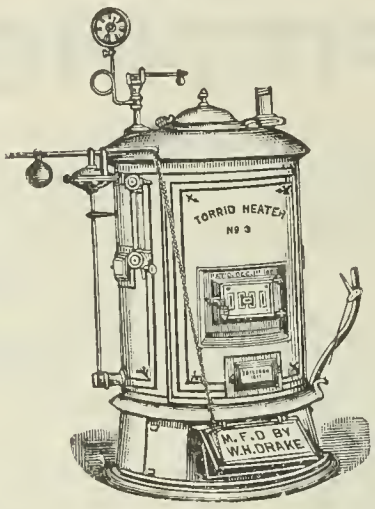

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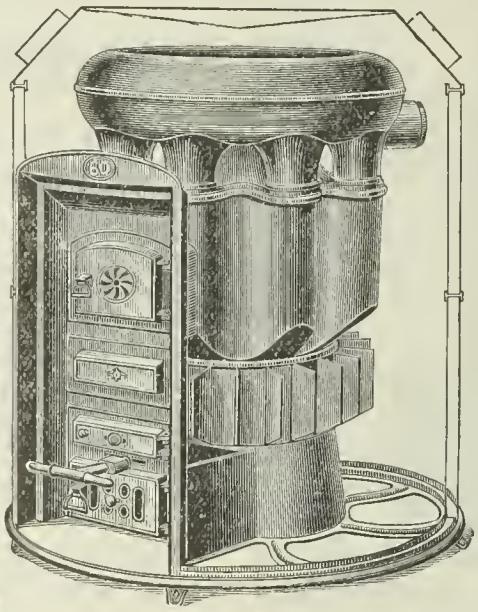

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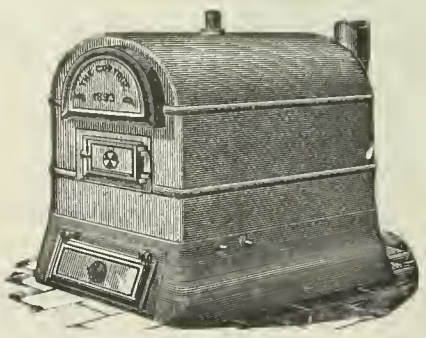

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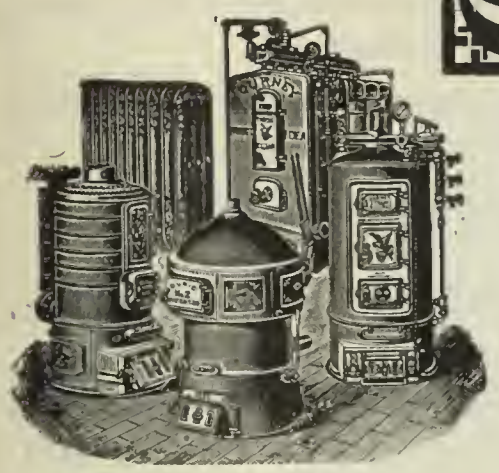

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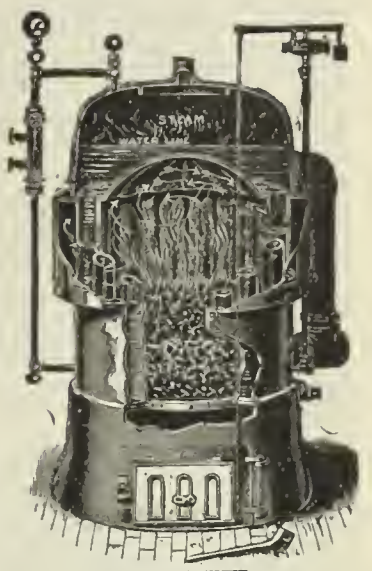

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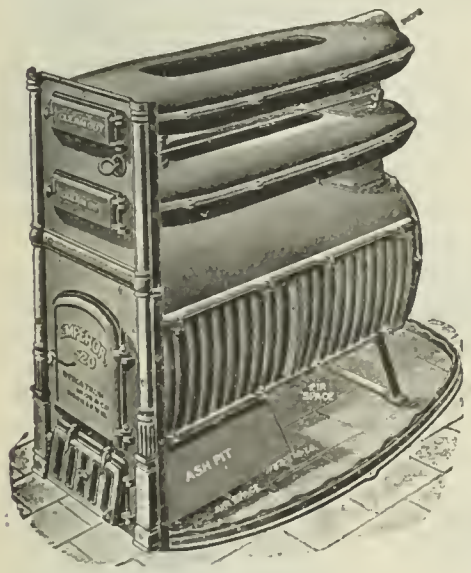

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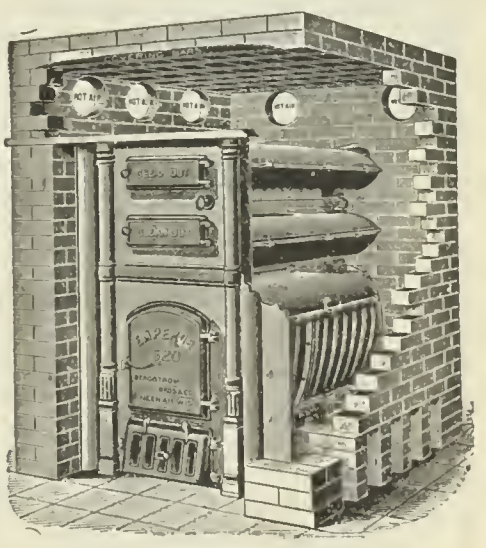

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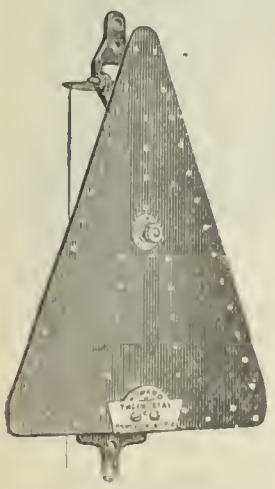

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" 4. Two-Pipe Steam Heating.
" 5. Single Pipe Low Pressure Steam Heating.
" 6. Indirect Steam Heating.
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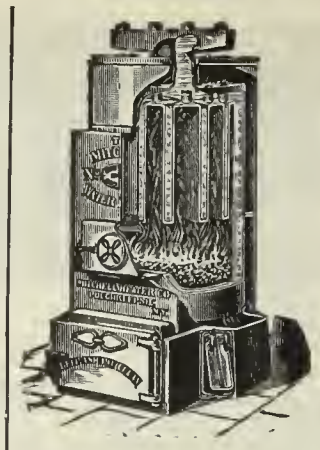

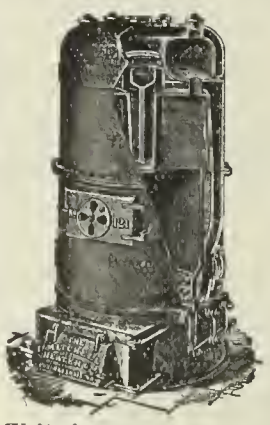

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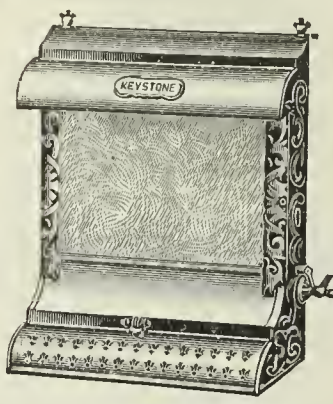

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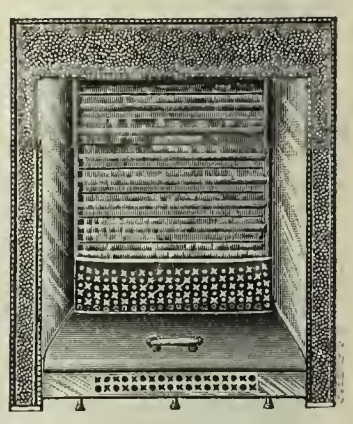

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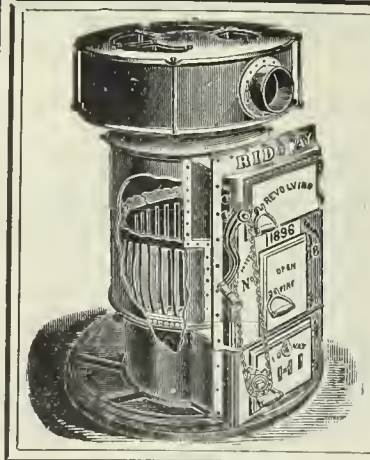

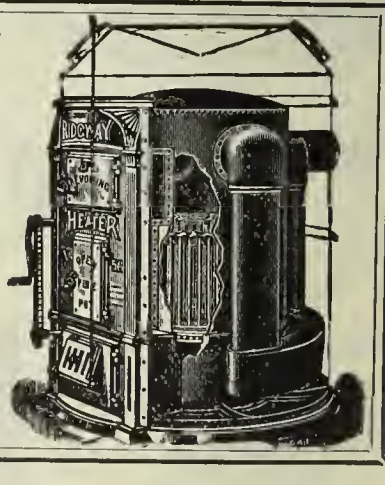

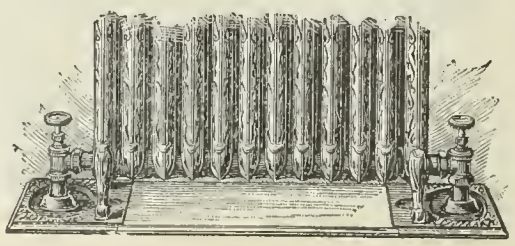

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A thoroughly practical device to finish under Radiators to assist steam fitter in making nice work.

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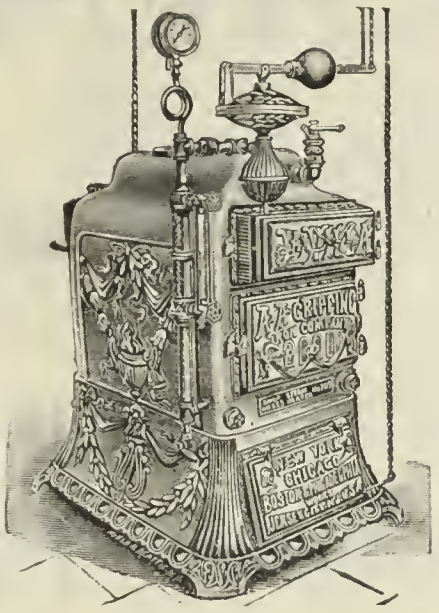

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Who carry in stock Black and White Japanned, Nickel, Brass, Bronze, Copper, and Antique Copper Finishes.

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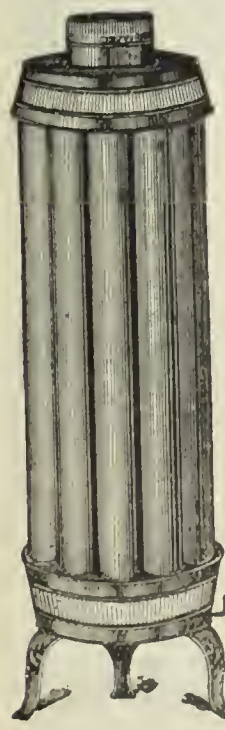

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D. B. Taylor & Co., Baltimore, Md.
J. L. Perkins & Co., Chicago, Ill.
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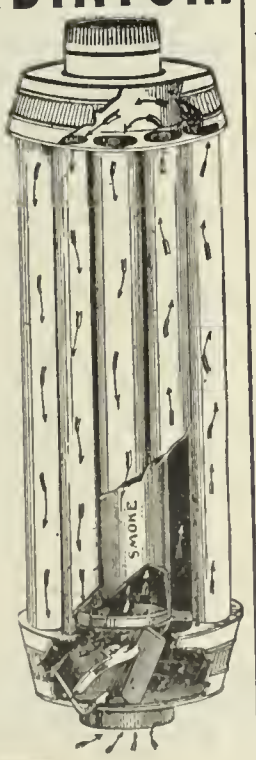

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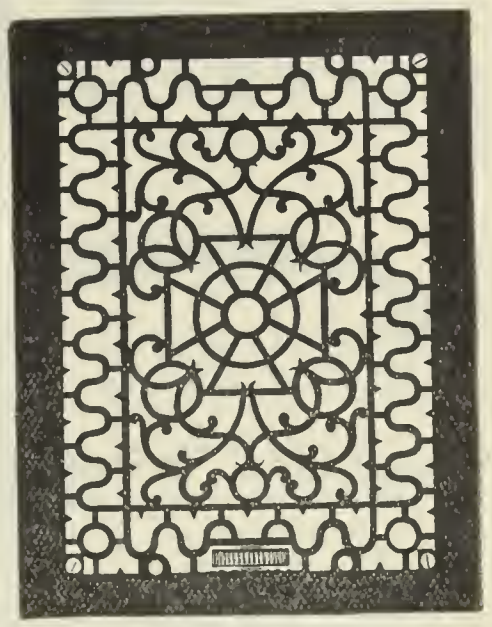

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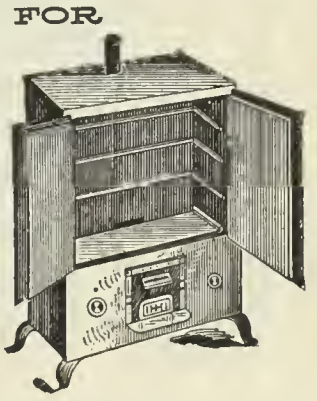

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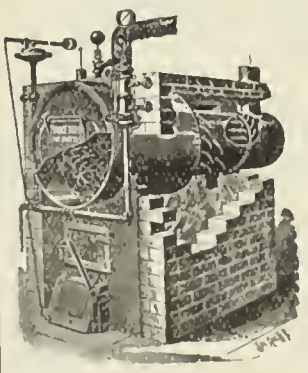

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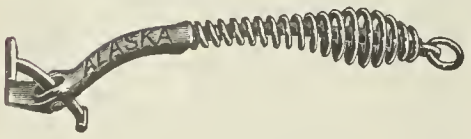

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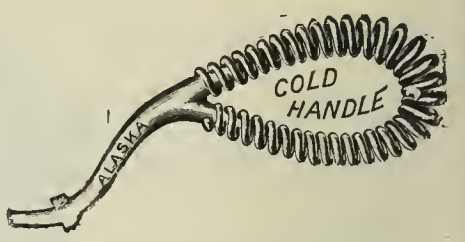

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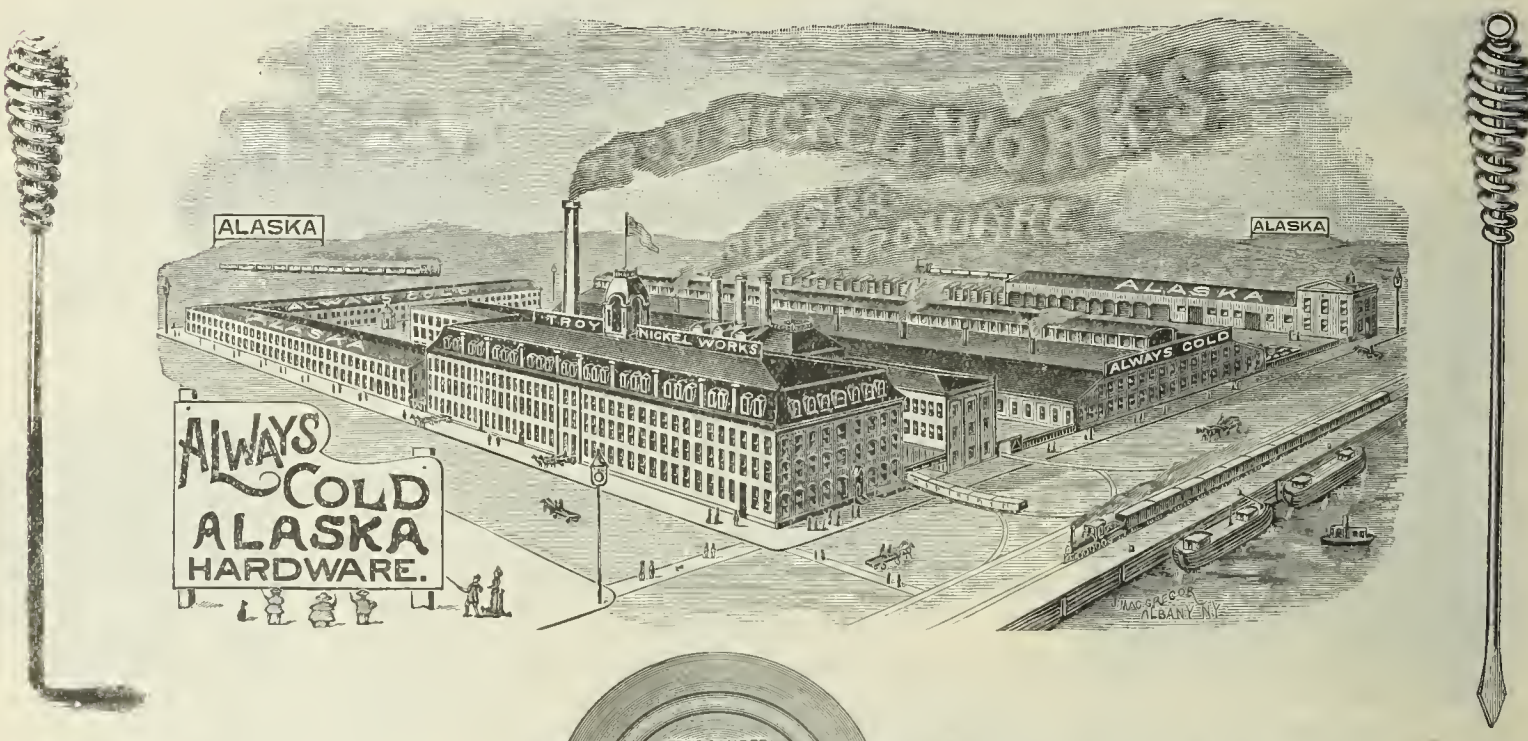

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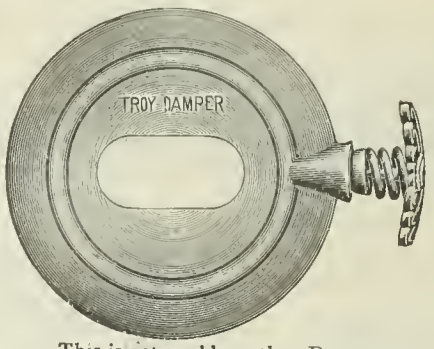

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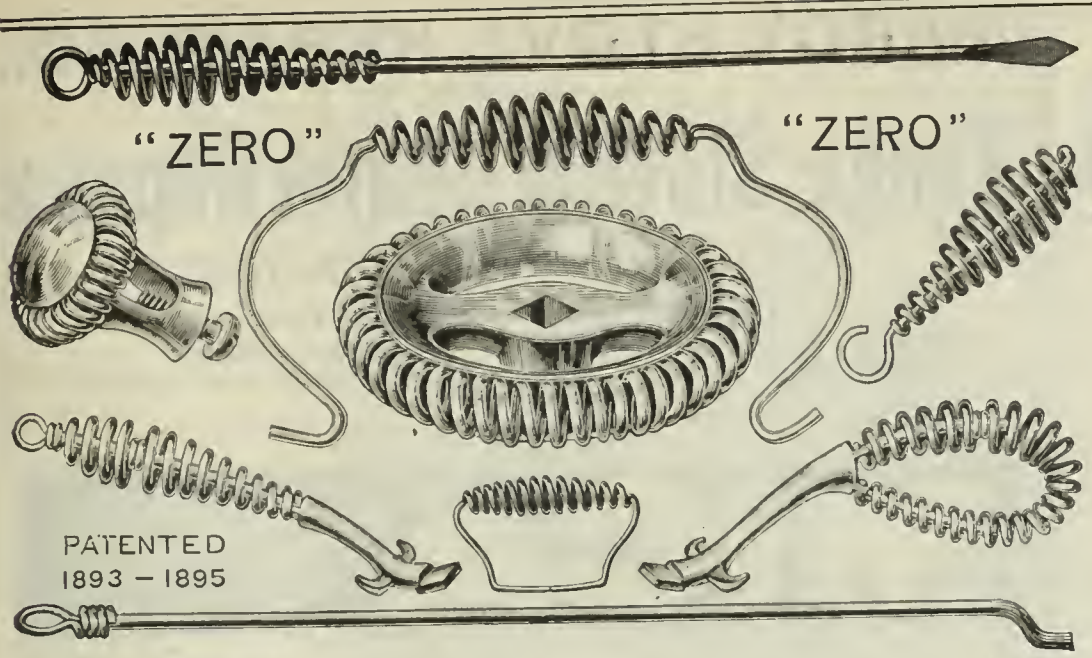

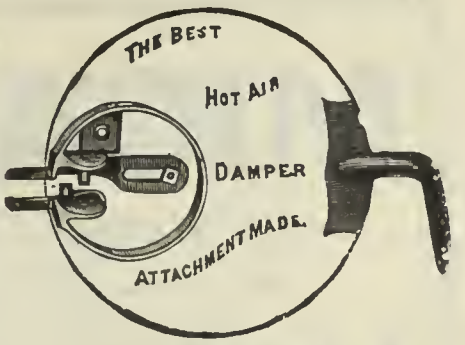

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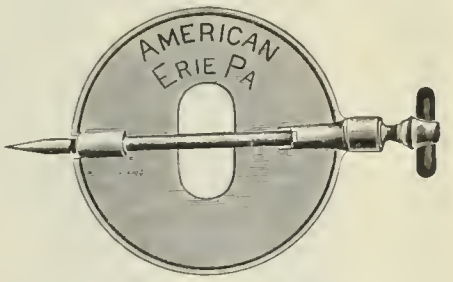

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Our Specialty is Fine Stove and Range Castings. Pattern Castings Made, Filed and Fitted.

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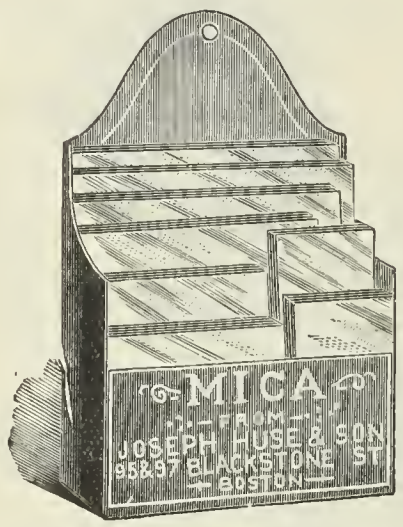

¼ pound	.....	2 x 3½
¼ "	.....	2½ x 2½
¼ "	.....	3 x 4¼
¼ "	.....	3½ x 5½
¼ "	.....	4 x 7
¼ "	.....	3 x 3¼
¼ "	.....	2¾ x 4
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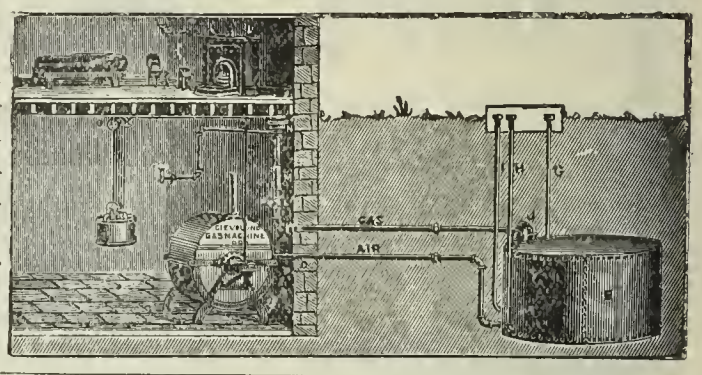

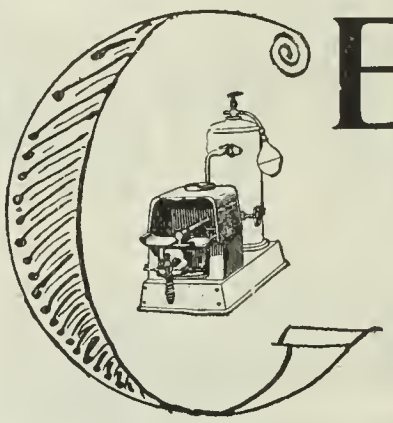

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are ready for use, possessing no offensive odor, no smoke, no noise, simple, powerful, durable, convenient and safe. They stand unrivalled, unexcelled and unequalled in their perfection. Try them.

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"O. H." One Piece Stove Pipe Elbows.

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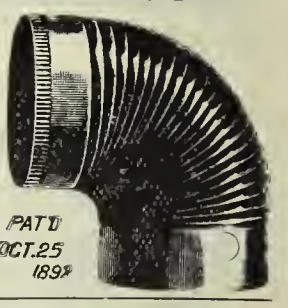

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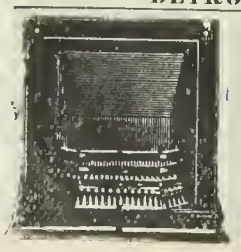

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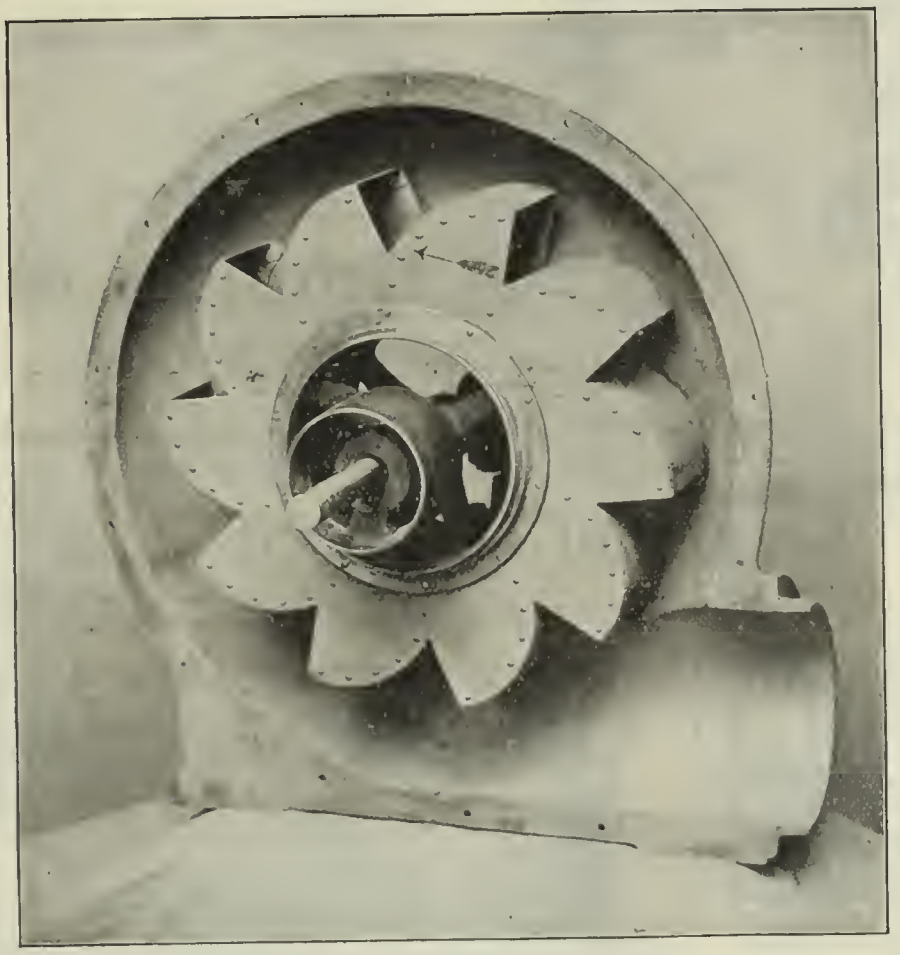

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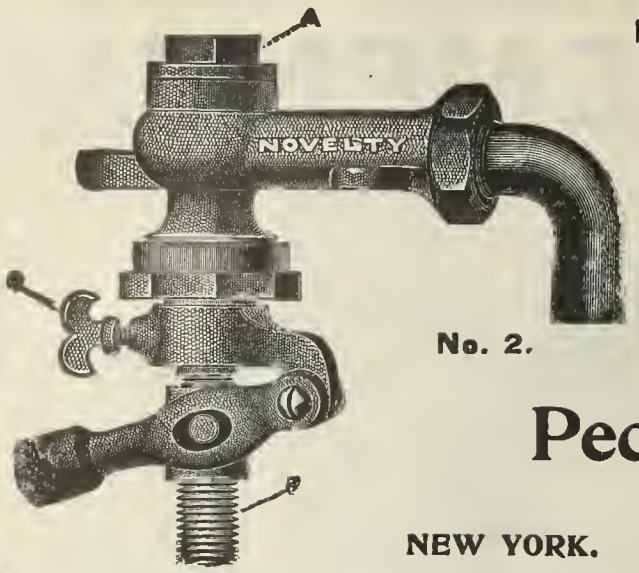

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Top Supply. Made also for Bottom Supply. Noiseless. For High or Low Pressure. Easily Repaired. Write for Prices.

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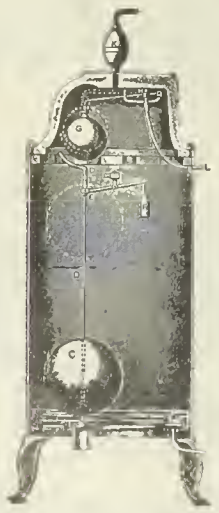

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Patented Oct. 15, 1895.

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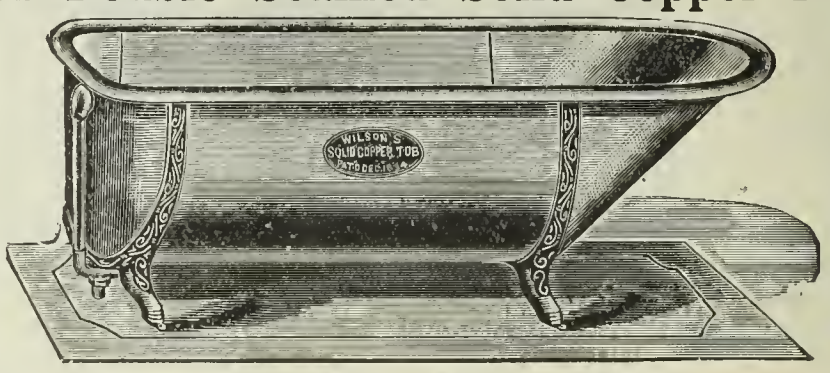
A Double Seamed Solid Copper Bath Tub,



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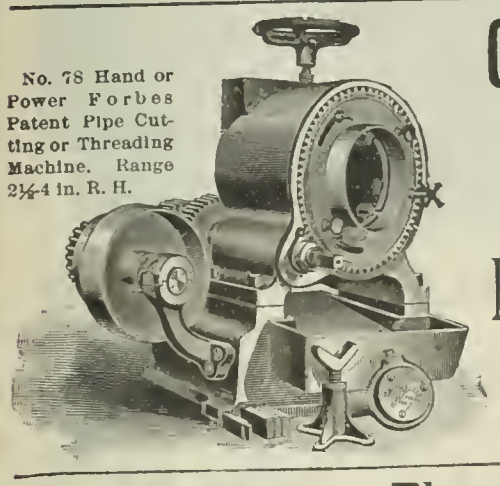

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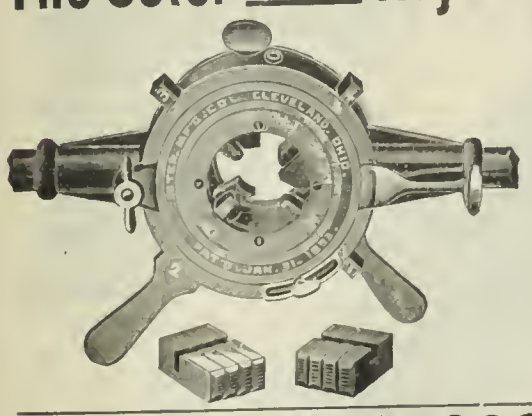

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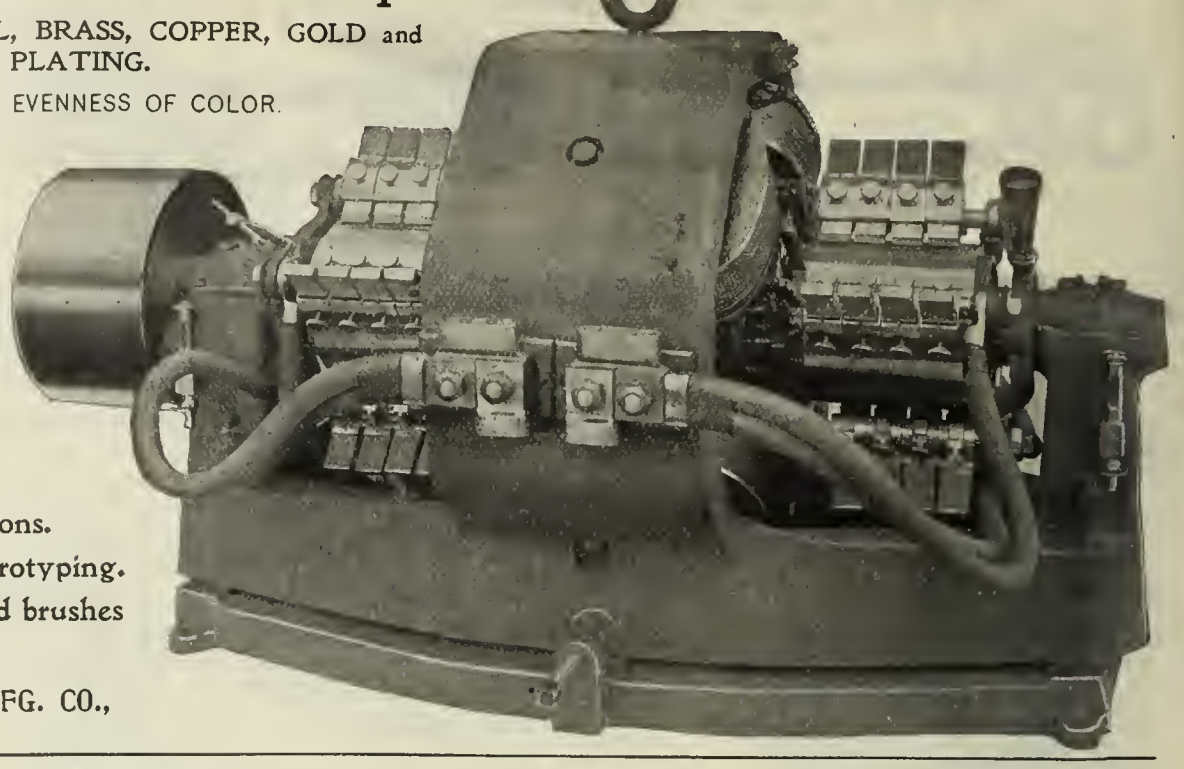

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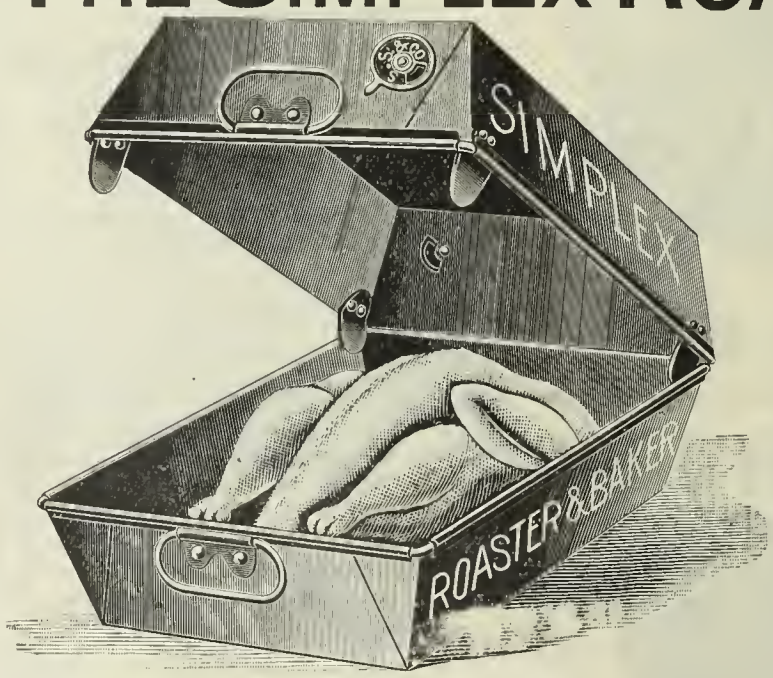

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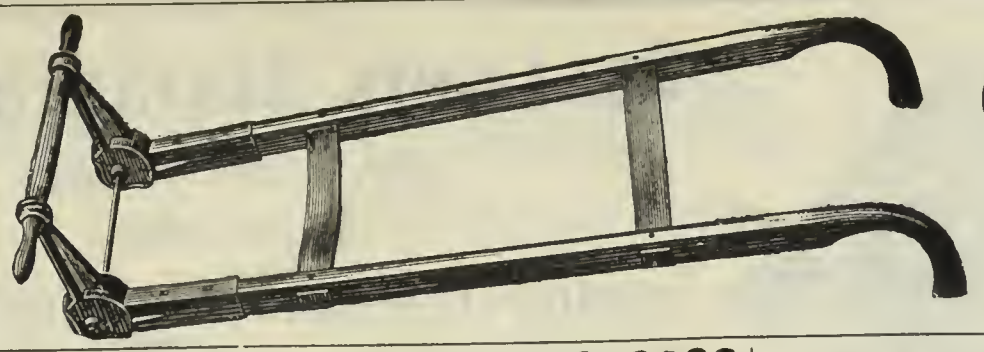

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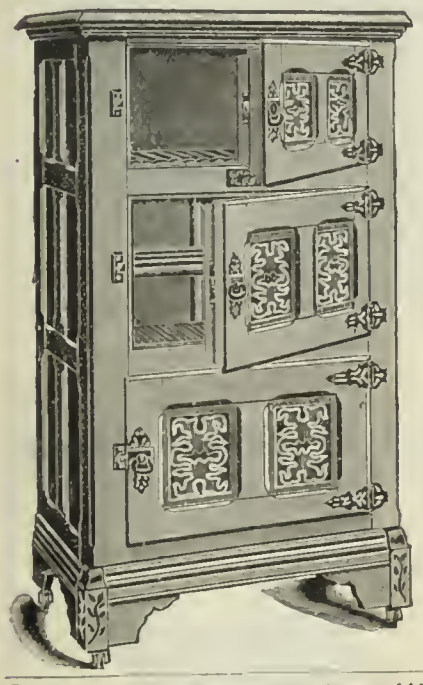

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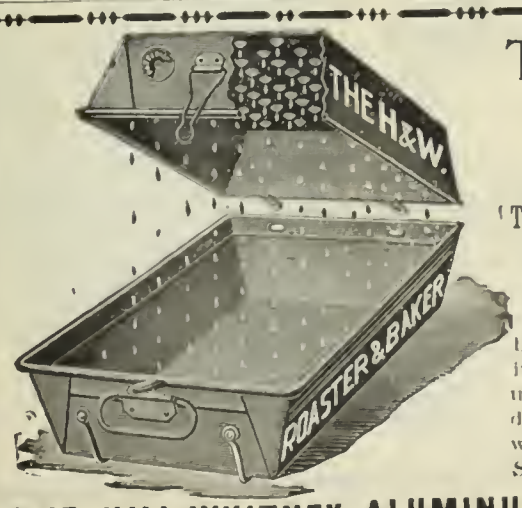

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—FILLING AN ALLOTTED SPACE.—It was the practice of a certain London editor some years ago to write his leading article or articles at home the night before publication. The rest of the week he did nothing. One night his articles had not come to hand at the office. Ten o'clock came, 11, 12 and still no sign of an article. There was commotion in the office, and at last a message was sent to the editor's house. He found him with a glass of brandy and water before him, and newspapers scattered about. There was no article written.

"What do you want?" asked the editor.

"The article for to-morrow."

"Didn't I send it?"

"No; at least it has not come to the office."

"Give me the Times."

The Times was found and handed to him, and with unsteady fingers he cut out one of its leading articles. This he stuck upon a sheet of paper, and then, taking his pen, wrote at the top: "What does the Times mean by this?"

In that form and with that introduction it appeared next morning as the editor's leading article.

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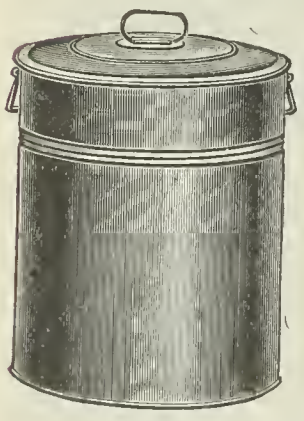

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WILL NEST AND PACK CLOSELY.

Crated six each of two or more sizes nested.

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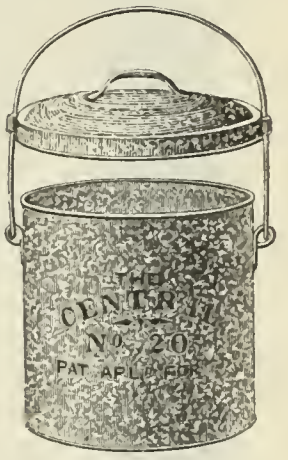

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Cover Always Attached.

FOUR SIZES.

Number	0	1	2	3
Diameter at top, inches,	20⅝	21¼	23⅛	24⅞
Diameter at bottom, inches,	16⅛	18	19⅝	21
Capacity, quarts,	44	52	62	71

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Galvanized AND Corrugated WASH TUBS.

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NO BUCKLING OR BENDING.

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Made in four sizes, tea and coffee.

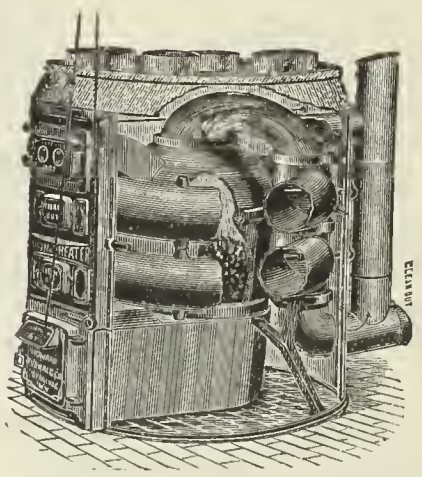
Acknowledged to be the handsomest pots on the market.

Send for New Catalogue.

furnace talk

The furnace dealer is often to blame by confining himself to competition where the first cost is the main condition of a contract. It is morally certain that the lowest price will afford the least amount of heating surface and the adoption of the cheapest materials for manufacturing purposes.

The Howard Double Radiator Furnace is not cheaply made. It is built as good as the best quality of iron and mechanical skill can contrive. The down draft is a distinctive feature in itself and lends originality to this form of construction. The two rings which encircle the body of the furnace mean something. They represent actual heating surface. When a fire is started the flames pass immediately up into the top of the combustion chamber, then down into the hollow radiator and around the furnace and down again into the other radiator, finally out through the elbow at the base of the furnace to the smoke-pipe. Whatever may be the argument in reference to the consumption of fuel from an economical standpoint, the principle of saving fuel remains the same. It is simply a question as to the length of time and extent of space which the product of combustion is made to take before leaving furnace. With a good chimney and when properly set this furnace is capable of doing more work with the same amount of fuel than any heater on the market to-day. Agents are wanted to sell this furnace.



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THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, December 18, 1897.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

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BRITISH AGENCY: The Ironmonger, 42 Cannon Street, London, England.

Volume XLVIII. ..... No. 25.
Index to Reading Matter ..... Page 57.

The Business Situation.

Considering that we have reached the last week but one of the year, the movement of trade, as a whole, maintains a surprisingly good volume. Although business in winter goods has been held back to a considerable extent by the unusually mild weather prevailing in all parts of the country, trade reports show that the demand for holiday articles is away ahead of anything recorded for this season in many years past. Reports from retailers in most of the larger cities at a distance from New York indicate a marked increase of custom in this line, and even in the East improvement is noted. At the same time there is the usual falling off in many lines of trade. The wholesale houses have been reducing their stocks so far as convenient, in order to carry over as little as possible into the new year's accounts, and buyers have followed a similar policy. Dealings in the speculative markets have not been heavy. Thus last week's returns of bank clearings showed a smaller total than in the previous week, which was one of the best of the year. The clearings of last week were large, however, even when compared with previous years of prosperous business, and were one-fourth better than they were in the corresponding week of 1896. Railway earnings are excellent, showing exceptionally large increase over last year's figures. One by one the roads are returning to the ranks of dividend payers, and the value of their stock is appreciating in the market. Exports continue remarkably heavy, and include some large shipments of machinery and other iron and steel products. November's figures exceeded $115,000,000, and for the 11 months the aggregate was over $970,000,000. The records of all previous years, either calendar or fiscal, seem likely to be broken by 1897, as the largest aggregate ever before known was $1,051,000,000, in the last fiscal year. Wheat shipments to foreign countries exceeded 6,000,000 bushels last week, and exports of this grain since July 1 have been about 111,000,000 bushels or 5,000,000 bushels more than in any similar period in the history of the country. The demand for corn, too, continues heavy, and cotton, while still selling at low and unprofitable prices, shows an improving tendency as the outlook for an increased consumption abroad grows favorable. The probable combination of large wire and wire rod interests has stiffened prices a little in that line, and some large orders for billets and structural material have been placed in the past week. The metal trade has been dull, with prices virtually unchanged. Copper, however, displayed a firmer tone, and tin plates show a little more life.

Our Manual Training Schools.

Beneficial results of a varied character are flowing from the establishment of manual training schools. Some of these are of a nature that was hardly foreseen by those who planted the seed for such institutions. Our methods of manufacturing, which are becoming more clearly defined every year, by which a man steadily runs a single machine or performs but one operation, are destroying the old ideas of learning a trade. A workman is now a specialist, just the same as men in other walks of life. The general mechanic, the all around man, once so numerous in this country, is fast disappearing. Yet the apprentice in a country shop, in which a little of everything is done, can no longer claim superiority over his brother in the city, because the machinery in a rural shop is not apt to be of the most modern character. The country bred mechanic can do well in emergencies requiring self reliance and perhaps ingenuity, but if he enters a large manufacturing establishment the chances are that he will require considerable instruction to become able to run the improved machinery found there. The operations requiring special skill and superior knowledge are also likely to be invariably intrusted to old hands known to be able to do the work properly; so that the beginner stands no chance in that direction unless he is specially favored.

Value of the Training.

The establishment of manual training schools, however, is filling a serious gap in our mechanical development, resulting from the causes enumerated. The instruction given is of such a wide scope in any branch taken up that the completion of the course fits the student to enter his vocation as a wage earner with a much more ample equipment than either the modern or the ancient apprentice. He not only possesses the practical knowledge requisite, but also has the scholastic training which makes him a thinker. The poorest manual training school gives instruction in drafting, mathematics and other studies, enabling the student to work from plans and, if he has any originality or mechanical talent, to prepare designs when required. But within very recent years a great impetus has been given to instruction of this character by the endowment of schools and colleges by wealthy men, who discern in the proper mechanical training of the rising generation a correct outlet for their own philanthropic impulses as well as a patriotic duty devolving upon them. This has resulted in signal instances in the equipment of these institutions with machinery and appliances of the most advanced character, far better than anything found in the average shop.

Growth in the West.

The managers of these schools are not obliged to be satisfied with the simple tools and elementary machines once deemed entirely sufficient for the purpose.

They are able to call upon the builders of the most ingenious machine tools for their best creations and to install in their workshops the latest developments of scientific construction. Graduates of such schools know how to turn out good work and are not satisfied with anything short of the standard to which they have been trained. Schools of this character are increasing in the West, in a section in which they are needed. Several have been munificently endowed by wealthy philanthropists within the past year or two, some of which are just being equipped. Builders of high class machinery are consequently finding in the growing manual training schools quite a market for their tools. But further than that, they are perceiving the effects of this special training in orders for such machinery from graduates who are now running factories or machine shops. The leaven is leavening the whole lump.

The Progress of By-Product Coke Ovens.

After a good deal of missionary work, says *The Iron Age*, and what appeared to be a strange hesitation in adopting modern coking methods, improvement in that direction is now under full headway. We have in the past expressed the conviction that in the technical department there is no line of work which promises to effect so material a reduction in the cost of manufacturing iron and steel in this country as does the introduction of Continental systems of coking with recovery of by-products.

The matter has entered into a new phase in this country, which may have a very important influence upon developments in the iron trade. In Europe all of the by-product coke oven plants, so far as we know, make fuel for the iron industry.

The ammonia, tar, benzole and surplus gas are incidental products. With us a new departure has been taken, the coke ovens becoming a part of municipal gas plants, the surplus gas being used for fuel and illuminating purposes. The coke goes into consumption for foundry purposes, for general industrial requirements and for domestic use, and ceases to be the main object of manufacture. Those who have done the principal work in this direction are the representatives in this country of the Otto-Hoffmann system. Construction has begun at Boston on a block of 400 ovens, the plans looking toward the erection, ultimately, of 1200 Otto-Hoffmann ovens in connection with the gas interests of Boston. We understand that negotiations are pending for the building of an additional large number of ovens at another tidewater city.

In the meantime there is great activity in the building of plants coupled with iron works. The Solvay Process Company have decided to double the number of Semet-Solvay ovens at the Ensley works of the Tennessee Coal, Iron & Railroad Company. In the Wheeling district the Riverside Iron Works are putting up 60 ovens at Steubenville and 60 ovens at Wheeling.

At Dunbar, Pa., the original plant of 50 ovens is to be doubled, and the same is true of the block of 25 ovens at Sharon, Pa. Negotiations are pending with one of the largest steel producers of the country and efforts are also being made to finance for a large plant in the Central West. In the Birmingham district two important interests are studying the problem.

Since the large pioneer plant of Otto-Hoffmann ovens at the works of the Cambria Iron Company, to which 100 ovens are to be added in the spring, there has, therefore, been much activity, and the question is naturally arising in the minds of some observers whether there is not some danger that the markets for by-products will not be seriously interfered with. If the iron manufacturers who invest money in by-product ovens, or tie themselves up with contracts with builders of such ovens, are to meet competition in by-products with large municipal gas companies, then there may not be as much money in the business in the future as has been hoped. Those who most closely watch the situation claim that the market for the by-products is practically unlimited, but perhaps it may be found that it will take a sharp reduction in the prices to expand consumption.

Primitive Metal Workers.

The earliest miners and metal workers of whom we have record, says *Self Culture*, were the Aryan peoples of Euro-Asian origin, who, though of pastoral and arboreal habits, were familiar with the metals and worked with them—at least with the metals gold, silver and bronze. Chaldeans and Assyrians, as we now know from the cuneiform inscriptions which go back 3000 B.C., were undoubtedly expert in the use of metals, while the Egyptians had an intimate knowledge of the arts and sciences. In the brick and other inscriptions recently discovered artisans are seen at work with curious details of their methods and tools. Potters, indeed, had attained eminence in their art, and the Egyptians had certainly a knowledge of chemistry, as the samples of their glass blowing and the stone pictures of tools, forceps, blow pipes, &c., prove. Gold was largely used at an early period—between 4000 and 5000 B.C., as we find from some newly discovered and ingenious weighing balances. Many centuries older than the pyramids, which date from 50 to 60 centuries back, we have examples of engineering in Memphis which could not have been constructed without tools and necessarily an acquaintance with metals. The word "metals" is of Semitic origin—the Hebrew word "metals," to forge, indicates an early acquaintance with the fusing of ores and the malleability of metals. How these early primitive people discovered the uses of things must, of course, have been through their wants and needs, particularly after they left pastoral and tent life and began to build cities. The Arabs are credited with being early acquainted with the alloys, though alchemy, as a science, dates only from the sixteenth century.

We are in receipt of a copy of the eighteenth annual report of the Indian Industrial School, Carlisle, Pa., which gives particulars relating to the educational and industrial training of the young Indian men and women at that institution during the fiscal year ended June 30, 1897. In the past year 419 male and 304 female scholars passed through the school. Of the former, nearly all were taught a trade as a part of their educational course. The trades in which instruction is imparted include carpentry, blacksmithing and wagon making, harness making, tailoring, tinsmithing, shoe making and printing. The aim of the management is to turn out intelligent workmen and, to this end, a very complete course of trade teaching is carried out.

The Treasury Department has issued the following official statement of the average prices of farm products in the United States in 1897, with comparisons for the three previous years:

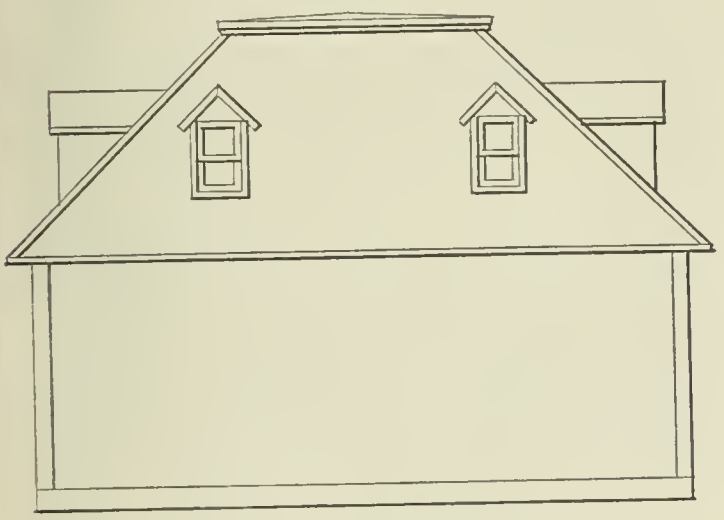
	1897.	1896.	1895.	1894.
Wheat	....	72.7	53.2	49.8
Corn	26.5	21.4	26.7	45.6
Oats	21.5	18.5	20.5	32.9
Potatoes	....	23.7	28.8	55.5
Cotton	....	6.6	7.59	4.9
Rye	44.7	40.3	43.7	50.5
Barley	37.7	32.2	35.4	44.3
Tobacco	....	6.0	6.6	6.7
Hay	$6.65	$6.54	$9.38	$8.35

The Department of Agriculture is arranging for experiments to be made at the agricultural experiment stations with the use of steel tracks on ordinary roads. The idea, which has been pushed forward by General Roy Stone of New York, is to have a steel track about 8 inches wide laid in the place where ruts are now found in most roads. This track, as proposed by General Stone is in the form of a steel trough, bottom up, with suitable joints and a small lip to guide the wheels. It is 7-16 inch thick and weighs about 65 pounds to the yard. The cost per mile is calculated at $3500. Sample sections have been laid down recently in New Brunswick, N. J.; Geneva, N. Y., and Lenox, Ill.

THE LETTER BOX.

Barn Roof Sweats.

From M. B., Baraboo, Wis.—Will *The Metal Worker* please give me some light on the following subject? We have recently covered a building that is 60 feet square with hip roofs and a tin deck with steel roofing. It is used as an animal barn, and there are about 20 elephants kept in it. It is heated by a 47-inch portable hot air furnace having a galvanized iron jacket and a 30 x 30 inch square register set in the top of the bonnet. Cold air is taken in at the back from the main room, 6-inch holes being left all around the bottom of the jacket for admitting air. We had misgiving as to the sweating of the roof from our past experience, but were advised that a layer of paper underneath the steel would prevent the condensation of moisture. The steel roofing and the tin on the deck are laid on a sheathing that is tightly laid with a tongue and groove. On this sheathing there are two thicknesses of resin paper. The roof, however, has made us trouble from sweating on the under side and we would



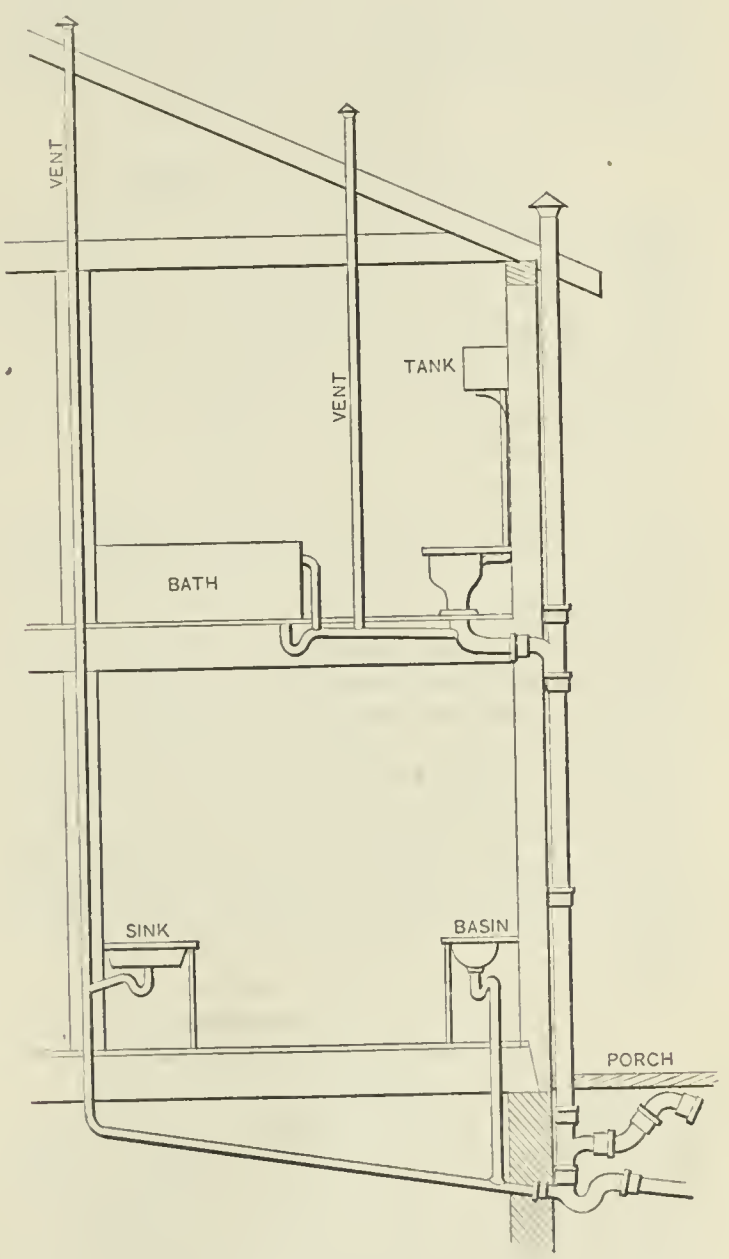
Barn Roof Sweats.

be glad to hear of a remedy for it. We submit a sketch showing the shape of the building. There are eight dormers for ventilation located about half way from the eave to the deck. The boarding on the under side is covered with condensation to such an extent that the water just runs off in a stream. Would a large ventilator placed in the deck do any good, or will we have to board up the lower side of the rafters? We would like to know what can be done with it, and think others would be interested in the problem. Would the trouble have been avoided if we had used felt roofing?

Note.—We shall be glad to have our readers who have had experience with roofing give their views on this subject. It would seem that all ordinary provisions had been made to avoid trouble from condensation. In order to solve the problem when the effect is known it is well to understand the cause. In this case the iron roofing and the sheathing on which it is laid will be considerably cooler than the atmosphere in the barn, and as a result any moisture in the atmosphere in the barn when brought in contact with the cool surfaces of the sheathing will result in condensation. In order to avoid this some step must be taken to prevent the moist air coming in contact with so cool a surface. One of the best non-conductors for a building is an air space, and it will be seen that if the rafters were provided with a ceiling of matched boarding on the under side a long step would be taken toward preventing the ceiling of the barn being cool enough to effect such a profuse condensation as is reported. If a ventilator was used in the deck as proposed it would make a very material difference in the amount of heat required in the barn. It doubtless would have the effect of carrying off the moist air. If there is a trap door in the deck this might be left partly open by way of experiment to test the efficiency of a ventilator for the purpose mentioned.

A Defective Plumbing System.

From C. R., Merced, Cal.—I submit herewith a rough sketch of a piece of plumbing work that has come under my observation. Those who did the work claim it to be



A Defective Plumbing System.

sanitary, but I differ with them in several points and would like to hear your judgment on the same. There are a bathtub, a water closet and a washstand in the bathroom, the washstand not being shown. The water closet is properly trapped. There are a sink and a wash basin on the first floor and the sink trap is vented. All of the pipes are on the north side of the house. The trap on the front wall of the house is 175 feet from the cesspool. The waste from the kitchen sink and the wash basin enters the front wall trap at the heel. The trap from the bathtub also connects with the heel of the closet lead bend. The closet

pipe is 4-inch cast iron pipe, and the waste pipe is 2-inch. Above the front wall trap is a sanitary tee and two 1-6 bends are connected with it to serve as a fresb air inlet. The kitchen door opens directly over the front wall trap. I would call special attention to the method of connecting the bathtub overflow.

Note.—To put the main soil stack on the outside of a building, and particularly the north side, would insure its freezing in some sections of the country. The method of connecting the overflow from the bathtub would allow any foul odors or disease germs which might be in the soil stack to pass into the building when the wind was in the direction to cause them to do so. It would be difficult to prevent the siphonage of the basin trap shown without a vent connection. The method of connecting the sink on the first floor and the basin with the main drain is quite as unique as the fresh air inlet arrangement, and while the method of connection is not insanitary it is a departure from what is considered the best practice. To locate a fresh air inlet so near the kitchen door would be a violation of the regulation of some cities. The overflow from the bathtub should be connected with the trap below the water line, and the vent from the trap should be connected where the overflow connection is now made. The defects which are here pointed out are sufficient to show that the system is open to a good deal of improvement.

Pipe for Water Wheel Supply.

From J. T. M., Manchester, N. H.—Will you be kind enough to give me a little information on the following question : How large a pipe is needed to supply a water wheel with an outlet of 20 square inches with a 33-foot head, so as not to have too much loss by friction ? The pipe will at one place drop 15 or 20 feet, with two elbows. The length of the pipe is about 100 feet. About how much lead should be put into a joint on a 16 or 18 inch pipe for water supply with a 33-foot head ?

Answer.—The 20 square inches outlet under 33 feet head will vary very considerably in its volume of flow by its form, or whether cut up in a number of openings, as in a turbine wheel. A narrow wheel gate, say 1 inch wide by 20 inches in length, will pass 380 cubic feet of water per minute under 33 feet head. The friction of the water in the 100 feet of pipe with two easy elbows will amount to ½ foot from the head with an 18-inch pipe, and to nearly 1 foot with a 16-inch pipe. We recommend the 18-inch pipe as the most desirable size. There is considerable difference in the socket area of cast iron pipe by different makers for the same sizes. We can only estimate for the mean dimensions at 25 pounds lead per joint for 18-inch pipe and 20 pounds per joint for 16-inch pipe, the gasket and bead occupying 1 inch in length of a socket 4 inches in depth.

The New York Convention of the National Association of Manufacturers.

The district members of the National Association of Manufacturers of the United States, consisting of Warner Miller, chairman ; Augustus G. Paine, treasurer ; Charles E. Locke, secretary ; Pliny Jewell, Benjamin Atha, Charles A. Schieren and Charles A. Moore, vice-presidents, have been in almost constant session during the past two weeks organizing for the third annual convention of the National Association of Manufacturers, which will be held in New York January 25, 26 and 27. The business sessions will be held in the Masonic Temple, corner Twenty-third street and Sixth avenue, upon the days of Tuesday, Wednesday and Thursday, January 25, 26 and 27, and upon Thursday evening, January 27. Additional committee rooms for the accommodation of the various sections of the association have been secured at the Fifth Avenue Hotel, which is near the Masonic Temple. The social headquarters will be at the Waldorf-Astoria. The night of Tuesday, January 25, will be devoted to a Bohemian Smoker, the details of which are in the hands of a committee. The banquet will probably be the largest ever given in a hotel, and will also take place at the Waldorf-Astoria on the night of January 27.

The convention committees are as follows :

Executive Committee.—Charles A. Schieren, chairman ; Seth M. Milliken, Charles T. Hughes, Frank S. Witherbee, A. R. Whitney, William F. Cochran, Henry B. Haigh, Lowell M. Palmer, William Barbour, Philip T. Dodge, Marcellus Hartley, George H. Robinson, Norton P. Otis, Edward R. Ladew, E. A. McAlpin, Frederick G. Bourne.

Finance Committee.—Augustus G. Paine, chairman ; Albert A. Pope, Stewart Hartshorn, Charles Steinway, Eberhard Faber, Allan MacNaughtan, Lowell M. Palmer, Charles E. Bigelow, Sigourney W. Fay, Jordon L. Mott, Charles E. Hauselt, Frank L. Babbott, Joseph C. Hoagland, J. Walter Spalding, William C. Beer, George F. Perkins, John Hanan, Richard Young, Charles H. Webb, Robert Hoe, Timothy L. Woodruff, E. D. Church, William A. Nash, Alfred Dolge, Robert H. Swayze, H. G. Dunscomb, George Frelinghuysen.

Entertainment and Reception Committee.—Charles A. Moore, chairman ; J. Frederick Ackerman, Ludwig Nisser, Charles H. Simmons, William McCarroll, Walter L. Pierce, Charles A. Schieren, Jr., Richard Young, H. A. Rogers, Robert W. Nelson, Frank Hooper, John Hanan, Theodore F. Miller, Thomas B. Kent, Arthur L. Merriam, C. H. Dale, Robert E. Jennings.

Banquet Committee.—William Brookfield, chairman ; R. A. C. Smith, Walter C. Gilson, Henry S. Manning, George E. Fahys, E. W. Bliss, A. Mollenhauer, H. C. Valentine, John R. Van Wormer, Richard Butler, W. O. Fayerweather, F. A. M. Burrell, Frank Squier.

Sub-Committee on Toasts and Speakers.—Warner Miller, Charles A. Moore, William Brookfield, Henry B. Haigh and Benjamin Atha.

Sub-Committee on Bohemian Smoker.—E. A. McAlpin, J. Fred Ackerman, William McCarroll, Walter L. Pierce and Edward R. Ladew.

Committee on Badges.—Frank Squier, Charles A. Schieren and Charles E. Locke.

It is expected that the most notable names among the public men of the country will appear in the list of speakers. Letters are being constantly received at the convention offices, Rooms 80 and 81 Times Building, asking for the reservation of places at the banquet. The committees are all at work and propose making the coming to Greater New York of the manufacturers of the country an event long to be remembered. It will be the first important gathering in New York after the new charter goes into effect.

In capital invested, the value of products and the number of hands employed the National Association of Manufacturers probably represents a larger aggregate than any other business organization in the world. It was formed in January, 1895, as the result of a widely existing desire for a strong and well balanced organization, thoroughly national in its character, equipped for the performance of any service which the manufacturers of the United States might require. Upon this basis the association has developed into a powerful organization, embracing in its membership upward of 1000 of the largest manufacturers' interests, representing every important industry and every prominent industrial center in the country.

The work of the National Association of Manufacturers naturally falls into groups—that which pertains to the home interests of the manufacturers of the United States, and that which relates to American trade with foreign countries. Among those objects which pertain to home interests are these: The Conservation of the Home Market, the Creation of a Federal Department of Commerce and Industry, the Improvement of Patent Laws, the Unification of Railroad Freight Classification, the Enactment of a Uniform Bankruptcy Law, the Improvement of Internal Waterways.

It is entirely without the pale of politics and embraces in its membership men of widely differing and pronounced political views.

The tariff is viewed by the association as a business problem, not as a matter of political capital, and the adjustment of the rates of duty in such a manner as to equalize the cost of imported articles and goods made in the United States represents the view of the tariff problem as held by the majority of the members of the association.

In the investigation of foreign markets, the establishment of sample warehouses, the improvement of the consular service, the restoration of the American merchant marine and the restoration of treaties of reciprocity the association aims to apply practical business methods. The plans for the foreign work of the association provide for the careful investigation of possible new markets for American products, the study of trade conditions in various countries and the ascertainment as fully as possible of the classes of American goods salable in different markets, with the conditions of competition which must be met. These agencies are designed to be warerooms for the display of American merchandise of every description under conditions that will secure the most favorable attention of the possible purchaser.

A consolidation of the gas companies of Boston, Mass., has been effected, a New York syndicate having purchased the various plants, paying about $14,000,000 for the properties.

HEATING AND PLUMBING.

THE NEW YORK TRADE SCHOOL.

The formal opening of the day classes for the seventeenth season at the New York Trade School, First avenue and Sixty-seventh street, New York, was held on Wednesday afternoon at 3 o'clock. The exercises were opened by Superintendent H. V. Brill, who introduced Wm. E. Dodge of the Board of Trustees. In his welcome to the pupils Mr. Dodge advised close application with the cultivation of correct habits in work and life and the avoidance of useless waste of time, material and thought. Such a course was pointed out as being the way to get the best that the school could give and enable the students to leave it well equipped for the business they had selected. He advised them also to prepare themselves for the responsibilities of citizenship, to study what constituted good citizenship and discharge its obligations with courage.

Edward Murphy was then introduced and recounted the high standard reached by former classes, and encouraged the new pupils to apply themselves to their work.

The school opens this year with 559 pupils enrolled, the largest number in its history. Below we give a list of the members of the Day Plumbing Class, which numbers 109, and in our Sheet Metal Department we give a list of the Cornice Class with 21 members. The evening class in electrical work this year numbers 50 members, the full capacity of the school, while 90 applications were received.

The Steam and Hot Water Fitting Class, which opens January 5, 1898, gives promise of taxing the capacity of the school, a large number of applications having been already received. The Evening Plumbing Classes have a membership of 171, the largest in the history of the school. A new course of instruction is an Evening Class in Drawing, in which pupils in the different classes can receive drawing lessons suited to their trades.

THE DAY PLUMBING CLASS.

Harry A. Ackley, Goshen, N. Y.
Frederick W. Allen, Arlington Heights, Mass.
John C. Alberts, Jersey City, N. J.
Chas. P. Bretherton, Bernardsville, N. J.
Willie H. Berry, Dryden, N. Y.
Harvey L. Benning, Wilkes-Barre, Pa.
Henry Behrens, Nyack, N. Y.
William L. Barrett, Winsted, Conn.
John D. Bell, Portville, N. Y.
Chauncy W. Brown, Ithaca, N. Y.
William L. Bull, Lenox, Mass.
John L. Bosch, Brooklyn, N. Y.
Clarence E. Clark, East Marion, L. I.
William H. Cope, Ypsilanti, Mich.
Isaac S. Collins, East Somerville, Mass.
George F. Cahill, New York City.
Dennis J. Coffey, West Winsted, Conn.
Edmond Croly, Ansonia, Conn.
Howard S. Dayton, Goshen, N. Y.
Albert S. Doremus, Goshen, N. Y.
John H. Davis, Portland, Maine.
Martin J. Duffy, Louisville, Ky.
John A. Duffy, Louisville, Ky.
Stephen A. Daunt, New York City.
Edward J. Egan, New Brighton, S. I.
Wm. H. Farrell, Shamokin, Pa.
William B. Feeley, Lenox, Mass.
Fred Gadsden, New York City.
Arthur B. Gordon, Patchogue, N. Y.
William E. Gross, Rockaway Beach, N. Y.
John T. Gabryelewicz, New York City.
Bernard J. Hand, New York City.
Emil H. Hill, Jr., Oyster Bay, L. I.
Henry Haas, New York City.
Martin Hauser, Jr., Unionville, Conn.
Chas. E. Haskell, Chestertown, N. Y.
Howard R. Hueston, New York City.
Louis A. Hebert, North Adams, Mass.
William H. Hartmann, Warren, Pa.
Charles Heiman, Canton, Ohio.
Harry W. Hayes, Lancaster, N. H.
Martin J. Hicks, Joliet, Ill.
Edson B. Hoag, Downsville, N. Y.
Jesse H. Irish, Peekskill, N. Y.
Thomas M. James, Jr., Newark, N. J.
Thomas E. Kane, Middletown, N. Y.
Will C. Kennard, Clearfield, Pa.
Ralph H. Killner, Brooklyn, N. Y.
Edward B. Kernan, Pittsfield, Mass.
George F. Langman, Monticello, N. Y.
George M. Mortenson, Jersey City, N. J.
Jonah W. Morris, Plymouth, Pa.
Joseph G. Miller, Lewistown, Pa.
John M. Moynihan, Bound Brook, N. J.
Wm. R. H. Munro, New Haven, Conn.
Fred W. Meinken, New York City.
Robert F. McCoy, New York City.
Presley O. McKinney, Palatine, W. Va.
Claude R. Nichols, South Arm, Mich.
Frank L. Noxon, Oil City, Pa.
William J. O'Brien, Washington, D. C.
Philip Ochs, Phillipsburg, N. J.
John C. Parsons, Aurora, N. Y.
Ernest M. Payne, San Luis Obispo, Cal.
August H. Putting, St. Louis, Mo.
Arthur D. Rogers, Chester, N. J.
Martin T. Relihan, Corning, N. Y.
Charles Reinhardt, New York City.
William A. Reaney, Jersey City, N. J.
Harry S. Ross, Hudson, Mass.
Lester R. Robinson, West Hammond, N. Y.
Henry Reimer, Davenport, Iowa.
Edward Ramsauer, Lindenhurst, L. I.
Edward J. Rebert, York, Pa.
Eugene H. Rustin, Brooklyn, N. Y.
Roscoe B. Robinson, Centre Moriches, N. Y.
Otto Reimers, Davenport, Iowa.
Edgar Z. Smith, Harrisburg, Pa.
Stephen Seavor, Tremont, N. Y.
W. Arthur Seresse, Fond du Lac, Wis.
P. Howard Stagg, Paterson, N. J.
William A. Swann, Newburg, N. Y.
William A. Sime, Adams, Mass.
Henry Stengel, Rock Island, Ill.
Joseph H Shoolin, Wilkes-Barre, Pa.
Fred A. Straw, Portland, Maine.
Ernest S. Sigler, Montclair, N. J.
Herman J. Stoff, New York City.
Frank C. Saward, New York City.
Patrick J. Sullivan, Holyoke, Mass.
Harry C. Tallman, Piermont, N. Y.
W. Ed. Thomas, New Bethlehem, Pa.
Eugene L. Tuthill, East Marion, N. Y.
Christian P. Tietje, Hoboken, N. J.
Alfred B. Thompson, Chester, N. Y.
Harry R. Vickerman, Pittsfield, Mass.
Guy Everitt Wyman, Nyack, N. Y.
William H. Watson, Rochester, N. H.

Angelo F. Wasserman, Nashville, Tenn.
Carrol B. White, New York City.
Emile Wall, Brooklyn, N. Y.
Frank M. Whelden, Ludlow, Vt.
Edward F. Wagner, Carlstadt, N. J.
John R. Woodford, Ithaca, N. Y.
William H. Youtzy, Lewistown, Pa.
George A. Ziegler, Aurora, Ill.

LAW TO PROVIDE COMPETENT BOILER OPERATORS.

In another column we print the law passed by the last Legislature of the State of New York, applying to New York City, which was designed to place the care and running of steam boilers in competent hands. The advisability of a law to provide some form of inspection of the safety appliances of heating boilers seems apparent from the bursting accidents that are reported from all parts of the country. If the care of the boiler was in charge of a competent person, and it was subjected to such inspection as a specially trained official could give, it is probable that such accidents as have been reported already this year from New England and the West would have been avoided.

When the new law for New York City went into effect (its sweeping character covering the ordinary low pressure house heating steam boilers), the preparations of the police department to carry out its provisions brought a demand for some less stringent enforcement from heating contractors and house owners. The house owner claimed he would adopt some other method of heating if he was required by law to stand the expense of a licensed engineer to run a steam boiler that had hitherto been satisfactorily run by a servant girl. The heating contractor complained that enforcement of the law would seriously interfere with his business. As a result of these complaints an opinion was asked of the Corporation Counsel of the city. On considering the provisions of the amendment with the other sections of the amended law this official gave an opinion that the law was not intended to be so sweeping in effect as to cover the cases cited in the complaints, and that the department might issue the permit given below to those who were sufficiently qualified to operate steam boilers for heating purposes.

Dated.....189 . Expires. .....189 .

PERMIT TO OPERATE STEAM BOILERS FOR HEATING PURPOSES.

ISSUED BY THE

Police Department City of New York.

PURSUANT TO CHAPTER 635, LAWS OF 1897.

This is to Certify, *that.....has been examined by .....practical Engineers (detailed as such by the Board of Police), as to his qualifications to take charge of and operate the.....* *Steam Boiler* **for Heating Purposes only,** *situate at .....and registered on the books of the Steam Boiler Inspection and Engineers' Bureau,* **SANITARY COMPANY,** *as Boiler No.....the steam pressure of which is limited by law to .....pounds, and was found qualified, and this License is granted to him only for the place and purposes mentioned.*

Examined by

.....

.....ISSUE.

.....
Sergeant Commanding Steam Boiler Inspection and Engineers' Bureau.
SANITARY COMPANY.

This License authorizes the person named herein to take charge of and operate THE STEAM BOILER MENTIONED, BUT NO OTHER, and will be REVOKED on proof of NEGLIGENCE or INSOBRIETY.

Any person operating a Steam Boiler in the City of New York without a License from the Department of Police, and any person continuing to do so after his License shall have expired or been revoked, will be guilty of a misdemeanor.

For.....

It is now reported that those who were instrumental in securing the passage of the new law are to bring an action in the courts to test the legality of these permits. It is also said that when the charter of the city of Greater New York goes into effect next year the new law of a special character will not apply. The information brought to light in the department having the enforcement of the law in charge brings out strongly the advisability of an inspection of all kinds of steam heating and cooking apparatus and some examination of those who have them in charge. The experience of New York City in this direction will be watched with interest everywhere, and it is possible that the future will find throughout the country some provision that will insure greater care and less risk in the use of steam apparatus of all kinds.

CHEAP HEATING APPARATUS.

BY A CONTRIBUTOR.

Those who have made a specialty of what was formerly called custom heating work look upon the advent of so much cheap heating apparatus as calculated to bring more harm than good to the trade. These cheap heaters are not confined to the hot air furnace trade alone, but the smaller kinds of boilers for both steam and hot water heating are being added to the lines of all the manufacturers. It is pointed out that the average man who is building a house has become imbued with a false idea of his shrewdness in buying something cheap. He is satisfied with his keenness when he refuses to profit by the explanation of the real value of a good heating apparatus, and instead accepts price alone for his guide and takes a small apparatus which may partially heat his building in mild weather. Even such heating, however, will only be accomplished by the expenditure of a great deal of care on the fire and an extravagant consumption of fuel.

With the smaller steam and hot water boilers, where the price has been the principal argument used in making the sale, it is more than likely that the mains and branches will be no larger than will just carry the minimum amount of radiation. Under excessive firing the house may be heated in ordinary or mild weather, but when the severe cold weather comes it will be impossible to secure the desired degree of heat in any of the rooms connected with the apparatus, on account of the scant radiation used. It is pointed out that in former days the gentleman who built himself a residence did it independently, and it represented to a large extent his personality throughout, and owing to his giving it his personal attention the heating received the care which its importance entitled it to, inasmuch as the health and comfort of the family for six months of the year depend very largely upon the heating plant. When this custom prevailed the heating man could readily explain the advantages of a special arrangement of the pipes and flues. This method of building, however, was supplanted by builders of the better class erecting three or four or a half dozen houses of what might be called the custom built type, and a man who desired a residence was saved all the care and annoyance of superintending his own building by buying a house of this class. Houses erected in this manner might truly be called speculative building operations, but as compared with the speculative building operations of today the term is a misnomer.

In instances where the operation will include from 50 to 100 houses a small difference on a furnace job or in a steam or hot water job may amount to a fair profit on the whole or be an item of some importance in the eye of the builder, and regardless of any superior merit the lowest bidder has been favored, creating a tendency not only to demoralize prices but to deteriorate the character of work done. As a result in many buildings a much smaller heating apparatus has been adopted and a system so cut down in its details has resulted that there is no profit in it for any who are engaged in the trade. The worst feature, without a doubt, is that the market is supplied. Neither the man who does the work nor the final owner is profited by it, and oftentimes the building operator goes to the wall in the process and all who have labored are only recompensed by the disappointment which they have reaped. When asked to suggest a remedy a somewhat cynical philosopher said : "Let the fools enjoy their

paradise, and those who have better sense will charge more, have more leisure and at least an equal amount of profit."

New York City Law for the Management of Boilers.

We print below an amendment to the statutes of New York, applying to New York City, which requires that all who run steam boilers must be provided with a certificate of qualification. This law went into effect May 22, 1897, with the approval of the Governor :

Chap. 635.

AN ACT to amend chapter four hundred and ten of the laws of eighteen hundred and eighty-two, entitled " An act to consolidate into one act and to declare the special and local laws affecting public interests in the city of New York," relative to engineers.

Accepted by the city.

Became a law May 22, 1897, with the approval of the Governor.

Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows :

Section 1. Section three hundred and twelve of chapter four hundred and ten of the laws of eighteen hundred and eighty-two is hereby amended so as to read as follows :

Sec. 312. The board of police shall preserve in proper form a correct record of all inspections of steam boilers made under its direction, and of the amount of steam or pressure allowed in each case, and in cases where any steam boiler or the apparatus or appliances connected therewith shall be deemed by the board, after inspection, to be insecure or dangerous, the board shall prescribe such changes and alterations as may render such boilers, apparatus and appliances secure and devoid of danger. And in the meantime, and until such changes and alterations are made, and such appliances attached, such boiler, apparatus, and appliances may be taken under the control of the board of police, and all persons prevented from using the same, and in cases deemed necessary, the appliances, apparatus or attachments for the limitation of pressure may be taken under the control of the said board of police. And no owner, or agent of such owner, or lessee of any steam boiler to generate steam, shall employ any person as engineer or to operate such boiler unless such person shall first obtain a certificate as to qualification therefor from a board of practical engineers detailed as such by the police department, such certificate to be countersigned by the officer in command of the sanitary company of the police department of the city of New York. In order to be qualified to be examined for and to receive such certificate of qualification as an engineer, a person must comply, to the satisfaction of said board, with the following requirements :

1. He must be a citizen of the United States and over twenty one years of age.

2. He must, on his first application for examination, fill out, in his own handwriting, a blank application to be prepared and supplied by the said board of examiners, and which shall contain the name, age and place of residence of the applicant, the place or places where employed and the nature of his employment for five years prior to the date of his application, and a statement that he is a citizen of the United States. The application shall be verified by him, and shall, after the verification, contain a certificate signed by three engineers, employed in New York city, and registered on the books of said board of examiners as engineers working at their trade, certifying that the statements contained in such application are true. Such application shall be filed with said board.

3. The following persons, who have first complied with the provisions of subdivisions one and two of this section, and no other persons may make application to be examined for a license to act as engineer.

a. Any person who has been employed as a fireman, as an oiler or as a general assistant under the instructions of a licensed engineer in any building or buildings in the city of New York, for a period of not less than five years.

b. Any person who has served as a fireman, oiler or general assistant to the engineer on any steamship, steamboat or on any locomotive engine for the period of five years and shall have been employed for two years under a licensed engineer in a building in the city of New York.

c. Any person who has learned the trade of machinist, or boiler maker or steam fitter and worked at such trade for three years exclusive of time served as apprentice, or while learning such trade, and also any person who has graduated as a mechanical engineer from a duly established school of technology, after such person has had two years' experience in the engineering department in any building or buildings in charge of a licensed engineer, in the city of New York.

d. Any person who holds a certificate as engineer issued to him by any duly qualified board of examining engineers existing pursuant to law in any State or Territory of the United States and who shall file with his application a copy of such certificate and an affidavit that he is the identical person to whom said certificate was issued. If the board of examiners of engineers shall determine that the applicant has complied with the requirements of this section he shall be examined as to his qualifications to take charge of and operate steam boilers and steam engines in the city of New York, and if found qualified said board shall issue to him a certificate of the third class. After the applicant has worked for a period of two years under his certificate of the third class, he may be again examined by said board for a certificate of the second class, and if found worthy the said board may issue to him such certificate of the second class, and after he has worked for a period of one year under said certificate of the second class he may be examined for a certificate of the first class, and when it shall be made to appear to the satisfaction of said board of examiners that the applicant for either of said grades lacks mechanical skill, is a person of bad habits or is addicted to the use of intoxicating beverages he shall not be entitled to receive such grade of license and shall not be re examined for the same until after the expiration of one year. Every owner or lessee, or the agent of the owner or lessee, of any steam boiler, steam generator or steam engine aforesaid, and every person acting for such owner or agent, is hereby forbidden to delegate or transfer to any person or persons other than the licensed engineer the responsibility and liability of keeping and maintaining in good order and condition any such steam boiler, steam generator or steam engine, nor shall any such owner, lessee or agent enter into a contract for the operation or management of a steam boiler, steam generator or steam engine, whereby said owner, lessee or agent shall be relieved of the responsibility or liability for injury which may be caused to person or property by such steam boiler, steam generator or steam engine. Every engineer holding a certificate of qualification from said board of examiners shall be responsible to the owner, lessee or agent employing him for the good care, repair, good order and management of the steam boiler, steam generator or steam engine in charge of or run or operated by such engineer.

Sec. 2. This act shall take effect immediately.

The San Francisco Plumbing Ordinance.

We have just received from John L. E. Firmin, secretary of the Association of Master Plumbers of San Francisco, a copy of the proposed plumbing ordinance for that city, and also some newspaper comments by those who are opposed to it becoming a city law. On an examination of the ordinance and comparing it with the ordinances in effect in other cities of the first class, we find that the provisions are similar. The variations in this ordinance are such as to conform to local conditions and to relieve it of what might seem harshness to the owner of old buildings if all of the desirable requirements were incorporated and rigidly enforced. We learn that final action on this ordinance by the local authorities has been deferred for one month in order that those who will have to pass on it will have ample time to become informed as to the advisability of its various provisions and to make such changes as may seem necessary in the interests of the people without detracting from its value as a sanitary measure. It is possible that some little advantage would be gained by the San Francisco plumbers if they would select from their files of *The Metal Worker* the copy of February 20, 1897, in which interesting examples of defective plumbing are illustrated by reproductions of charts showing cases of defective plumbing that were actually found in Massachusetts, and also showing pictures of parts of plumbing systems exhibiting defects which, if not explained, would pass unnoticed by the average citizen of intelligence.

Major J. B. Fish, superintendent of the Providence Gas & Water Company, Scranton, Pa., has just completed a commodious and convenient block in the rear of Bright's wagon works for the use of his increasing business. The building is two stories high with a well lighted basement, besides spacious rooms for storing a large stock of plumbing materials and for the use of his machines. It contains two sets of pleasant and comfortable living apartments. The design is that good men in his employ with their families shall occupy these rooms, and in that way the company will always have available help in emergency cases such as are likely to occur with plumbers and water companies.

Chicago Master Plumbers.

The Chicago Master Plumbers' Association has decided to hold its annual ball and reception on Tuesday evening, January 25, in Medinah Temple, corner of Fifth avenue and Jackson boulevard. The annual election of officers will be held at their next regular meeting, which takes place on the 28th of this month. Indications point to the election of the veteran J. J. Wade to fill the honorable and highly responsible position of president. Mr. Wade has a national reputation, and his selection for this office would doubtless be greeted with much pleasure by his many friends in the country at large.

The Water Seal Automatic Air Valve.

In the accompanying illustration we present a transparent view of the water seal automatic air valve which is being put on the market by the Judson A. Goodrich Company, 120 Beekman stret, New York. This valve is

The Water Seal Automatic Air Valve.

said to successfully overcome all the troubles that have heretofore arisen with the use of air valves. The construction is readily understood from the engraving. A flotation cup is provided in connection with a specially made expansion piece, so that it will close as a result of either expansion or flotation. The special feature of the valve is the diaphragm provided in the nipple which connects with the radiator and a pocket in the lower part of the valve into which this diaphragm extends downward. This compels the air and steam expelled from the radiator to flow through the upper passage only, and allows the water to return to the radiator through the lower passage, thus preventing conflicting currents. By this means the valve does not spit, sputter or sizzle water. Another feature is a plug in the bottom which may be removed for inserting a new expansion piece or cleaning the valve. The valve may be taken apart without removing it from the radiator, so that its parts may be readily cleaned, repaired or renewed. It will be seen that the construction obviates the necessity of a drip pipe.

John J. Ellis, 47 years old, a master plumber, died at his home, 1477 Lexington avenue, New York, Friday, December 12. Cancer of the stomach was the cause of his death. Mr. Ellis was born in Ireland, and came to this country when 12 years of age. He served his apprenticeship, and finally began business for himself. He was a member of the Master Plumbers' Association and other organizations. He leaves a widow and three sons.

NOTES.

Farquhar Brothers, tinsmiths, gas fitting and plumbing contractors and stove dealers, opened their new $10,000 building, at the corner of Barrington and Blowers streets, Halifax, N. S., on December 6, when hosts of their friends called and were shown over the commodious four-story structure. The building is of pressed brick with freestone trimmings and occupies a fine situation. It is 36 x 46, with a goods entrance on Blowers street near the elevator. The shop has a fine, high, oiled wood ceiling. In the rear is the office. On this floor are shown Favorite and Royal ranges, heaters, base burners, kitchen furniture of all kinds, gas and electric fixtures and combination fixtures of the firm's own manufacture, samples of the kind of work they can do in this line. The second floor is used for a show and store room, where goods will be kept while not in season. On the third and fourth floors are the tinsmith, plumbing and gas fitting workshops. The firm consist of James and Robert Farquhar.

President John E. Dugan of the Master Plumbers' Association of Albany, N. Y., informs us that the annual meeting was held in the rooms of the association in the Degraaf Building on Tuesday, December 7, when the following officers were elected: President, John E. Dugan; vice-president, Frank F. Schimpf; recording secretary, Joseph A. Stahl; financial secretary, John J. Bridt; treasurer. J. Edward Jones; trustees, William H. Van Loon, Charles Kanzelmyer and Adam Roos.

Texas Plumbing & Electrical Supply Company have been incorporated, with principal office at San Antonio, Texas, and branches in Austin, Waco, Fort Worth, Dallas, Houston and Galveston. The capital stock is $20,000, and the purpose is to do a general merchandise business. The incorporators are John E. Martin, N. Y. Petrich and William Martin, all of San Antonio.

C. F. Roetzel of Rockport, Ind., has bought out the Davis & Cakes Heating & Ventilating Company in Sycamore street, Evansville, Ind. The style of the new firm will be the National Heating & Ventilating Company.

Wm. H. Gallagher has been appointed Plumbing Inspector at Port Richmond, Staten Island, N. Y.

We have received from the Keystone Boiler Company, Huntingdon. Pa., a circular of their Keystone boiler, which is made of copper and cast iron. The construction is such as to present a large fire surface and give a horizontal return flue. The boiler is made in four sizes, adapted for both steam and hot water. The company report good sales of these goods, and that they are contemplating an enlargement of their plant to meet the demand. They also issue a hanger showing the details of the construction by several illustrations.

J. A. Campbell & Co., Washington avenue, New Haven, Conn., have recently made a substantial improvement in their store by extending the show windows out to the front line and making a fine display of plumbing goods in them. The firm are well supplied with contracts at the present time.

President S. E. Dibble of the Builders' Exchange, New Haven, Conn., is using every effort to increase the interest in the meetings held by the builders at noon every day.

The Foskett & Bishop Company, New Haven, Conn., and New York, have recently secured a number of contracts in New York City. Among them is an office building for Leo True on Great Jones street, a large apartment house for Irons & Todd, the Scotch Presbyterian Manse on Ninety-sixth street and the new school building No. 12.

Murray & Maher have the plumbing and the Hopson & Chapin Mfg. Company the heating contracts for Architect Dudley Donnelly's new residence on Ocean avenue, New London, Conn.

The plumbers' strike which has been in existence in Worcester, Mass., for some three months past has been settled. The trouble was over the number of apprentices or helpers hired in the different shops. The basis on which the settlement was effected is not disclosed.

O'Brien Brothers have bought out the stove and plumbing business of O. C. Knox on Exchange street, Chicopee, Mass.

Under the provisions of the gas fitters' law at Boston, Mass., it is urged by some that old fixtures in which the gas key may be turned so far around as to be turned on be condemned, and fixtures of the modern type with stops be provided in their place.

Donahue Brothers, Springfield, Mass., have been awarded the plumbing contract for the Convent of the Sisters of the Good Shepherd.

George A. Sanders of Laconia, N. H., has been awarded the contract for heating the hospital building of the Cottage Hospital Association and also the plumbing and heating of the Rhoda C. Ladd house.

T. S. Wilcox has been awarded a contract for plumbing the new police headquarters or city jail at Chattanooga, Tenn.

The plumbing establishment of Lee & Foley, Concord, N. H., was recently visited by fire.

The Water Board of Albany, N. Y., has come out in favor of good plumbing, making a rebate in the charges to those who have put their plumbing fixtures in first-class order or have put in a system of an improved type.

The Indianapolis Plumbing Company have been incorporated at Indianapolis, Ind., with a capital of $1000, by E. Steinhausen, C. F. W. Koeper and Leo Holtzman.

The Metal Worker acknowledges the receipt from President Cullotin of the National Association of Master Plumbers, Revere House, Chicago, of a new revised list of manufacturers and jobbers who have signed and are now in accord with the Baltimore resolutions. With the list comes a sheet containing several addresses of those who have come in accord with the resolutions since the printed list was completed.

The Pecora Paint Company, S. Bowen's Sons, successors, Philadelphia, Pa., are distributing various cards showing samples of the colors which they are prepared to supply. Reference is made in a circular which has also been sent out to the Pecora asbestos furnace cement; Pecora egg shell gloss enamel, used as a finishing paint for engines, tools and general machinery; Pecora Dresden machine finish, for radiators, steam pipes, tanks, &c., and Pecora iron filler, for making rough castings smooth, filling all irregularities and giving a smooth, level and even surface on which to apply their steel color mineral paint.

Clifford Schlemmer, 109 Beekman street, the New York representative of Oliver Schlemmer, Cincinnati, Ohio, left this week for a visit to Philadelphia, Baltimore, Washington and Pittsburgh *en route* for home to spend the Christmas holidays. On his departure Mr. Schlemmer left with *The Metal Worker* the necessary materials for making a smoke test of a pleasing nature.

We have received from the Richmond Stove Company, Norwich, Conn., a list of 40 heating contracts, which have recently been closed by their customers in various sections of the country, eight of which are for the Richmond Hot Air Furnaces, 15 for Hot Water Heaters and 17 for Steam Boilers. Among the prominent contractors handling these goods are Webster & Meathe, Detroit; Allen Black & Co., Minneapolis; the Smith & Abbott Company, Portland, Maine; James Donovan, Middletown, Conn.; J. J. Smith Plumbing & Heating Company, Cleveland, Ohio, and W. H. Buckley & Co., Burlington, Vt.

George I. Roberts & Brother, 471-473 Fourth avenue, New York City, are issuing in pamphlet form the Engineers' Law for the Greater New York, which requires that all who run steam boilers within the city limits shall pass an examination and receive a certificate of their competency for such work. The cover page states that they are prepared to furnish Engineers' Supplies for steam, gas, water and electric work. The inside of the first cover page shows the improved Utility Pump Governor. The last page shows the Roberts Combination Exhaust Muffler, Oil Separator, Return Tank and Pump Governor.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until January 7 for a low pressure steam heating and ventilating apparatus for the United States Post Office at Pueblo, Col., in accordance with the drawings and specifications, copies of which may be obtained from the Supervising Architect at Washington or from the Superintendent at Pueblo.

We are advised by the Detroit Stove Works, Detroit, Mich., that the report in circulation that they are bringing out a new Steam Boiler and Hot Water Heater for house heating is without foundation.

The Day-Ward Company, Warren, Ohio, send us a circular of their new Champion Instantaneous Water Heater, which they say is meeting with a good sale and giving satisfactory results. They will have a larger size on the market soon, and will be glad to furnish the trade circulars and information in reference to the Heaters, and also in reference to their line of Steel Clad Bathtubs.

The Indian Head Cotton Mill, at Cordova, Ala., is having a plumbing system installed by Thomas Hyde of Albany, N. Y., in which his patented system of ventilation for plumbing is being provided. This system provides a continual flow of air out from the building through the plumbing fixtures.

The Dover Machine works, Dover, Del., are installing the heating system in the State House, and are heating the Methodist Episcopal Church at Seaford and the residence of J. Rogers at Frederica.

The Decatur Cornice Works, Decatur, Ill., are just issuing a circular showing half-tone engravings of a handsome Radiator and Register Shield designed to prevent the discoloration of walls and ceilings by deflecting the rising air currents, so that the fine particles of dust fall before they can be deposited where their accumulation is disagreeable.

We have received from the Buffalo Forge Company, Buffalo, N. Y., a pocket edition of their general catalogue devoted to mechanical heating, ventilation and drying, showing illustrations of the various apparatus and containing tables and data of value to the engineer.

Golpin & Runyon, Binghamton, N. Y., have contracted to heat the residence of Joseph Bromley with a No. 4 Empire Hot Water Heater made by the Thatcher Furnace Company.

Fred D. Johnson & Co., 80 Centre street, New York, are just issuing a new catalogue of the Frontier improved Radiator Valves made by the Frontier Iron Works, Detroit, Mich., for which they are the general sales agents. The catalogue consists of 24 pages, showing illustrations and giving prices and dimensions of steam and hot water Angle and Corner, Quick Opening Globe and Gate Valves for radiators. Horizontal, vertical and angle Check Valves are shown and some specialties in Gate Valves.

Plumbing Inspector F. W. Tower of Springfield, Mass., gave a lecture on "The Theory of Plumbing Practice" in that city on December 14. Mr. Tower demonstrated a part of his lecture by using a ram with a glass chamber.

George P. Kirtley, Ed. Farley, E. Doherty and John Sharp are a committee from the Master Plumbers' Association of Kansas City, Mo., who are endeavoring to secure the passage of an ordinance to provide an assistant plumbing inspector.

L. E. Faison has opened a plumbing shop at Waycross, Ga.

John Collins has opened a plumbing establishment at Howe and Main streets, Passaic, N. J., and is making a fine display of sanitary apparatus. He is now engaged in plumbing St. Mary's Hospital.

Thos. S. Wilcox, the well-known plumber, Chattanooga, Tenn., will soon merge his plumbing business into a plumbers' supply establishment. Mr. Wilcox contemplates the erection of a three-story building near his present establishment, and will organize a plumbing supply house to handle plumbers' supplies both wholesale and retail.

Q. S. Backus & Co., successors to the Backus Mfg. Company, Williamsport, Pa., have issued from the press a catalogue of oblong shape illustrating and describing the Backus Patent Portable Steam Radiators for gaseous fuel. The Backus heater is referred to as "a miniature steam plant, combining in one piece a highly ornamental steam radiator in the form of a mantelpiece or tiling to fit into an ordinary mantel and fire place with logs." The upper log contains sufficient water when vaporized to fill the radiating surface surrounding it, and the lower log is a peculiarly constructed burner in which gas is consumed, the flame coming in contact with the boiler or upper log, igniting the asbestos fibers on it and producing an appearance of burning wood. The device is referred to as efficient, economical and healthful, and a long list of testimonial letters are presented to substantiate the claims made for it. Directions for connecting the heater are given together with illustrations of various varieties which are offered the trade.

John F. McCartney, Inspector of Plumbing of Worcester, Mass., was presented with a gold shield, emblematic of his office, at the quarterly meeting of the Massachusetts Association of Plumbing Inspectors held in Boston December 10.

The plumbing firm of Prince & Rausch, at Wabash, Ind., have been dissolved, James Prince retiring and Charles Rausch continuing the business. Mr. Prince will soon open an establishment, in which he will conduct a Grate and Mantel business in the same city.

John Ring, the journeyman member of the Board of Examining Plumbers of Cincinnati, Ohio, has resigned, and his successor will be appointed at the January meeting of the Board of Aldermen.

A new catalogue is received from Curtis & Curtis, Bridgeport, Conn., in the interest of their Forbes patent Die Stock for cutting and threading pipe by hand and by power. The first page is an introduction calling attention to the quality of their goods, which are already well known in the trade. The first two illustrations show machines designed for working pipe from ¼ to 6 inches in diameter by hand power. A list is presented of these machines, giving their capacity and weight from 138 to 750 pounds, together with prices. These are followed by illustrations of machines for hand and power and of machines

adapted for power alone. Another specialty is a pipe threading attachment for ordinary machinists' lathes. Three pages of the book are taken up with Nipple Chucks, Pipe Cutters, Ratchet Die Stocks and Pipe Vises, one of the Pipe Vises being adapted for carrying in the pocket, weighing but 3¼ pounds and capable of handling pipe from ⅛ to ¾ inch. The cover page presents the expense of cutting pipe by hand, as compared with the same amount of pipe cut with one of the machines, showing a balance in favor of the establishment which possesses the machinery.

Pittman & Dobree, Nashville, Tenn., have purchased the tinning and plumbing business of A. M. Notgrass.

Announcement is made in our advertising columns by the New Jersey Blower Company, Newark, N. J., that they have arranged with J B. & J. M. Cornell, Twenty-sixth street and Eleventh avenue, New York, for the manufacture and sale of the New Jersey Steel Pressure Blowers and Exhausters. The apparatus have already won a standing for foundry and blast furnace work and the firm will make a specialty of their introduction into the heating, ventilating and drying field.

Examining Milwaukee Plumbers.

Sixty master plumbers presented themselves for examination before the Milwaukee, Wis., Plumbing Commission on Friday, December 10, and 67 more were examined on Saturday for the purpose of securing certificates of competency to practice their trade. The list of journeymen plumbers who were examined on Monday and Tuesday included 168 names. The following printed instructions for the guidance of the applicants for the examination were distributed among them :

"Take the seat assigned to you and keep it during the entire examination.

"The 'identification sheet' and the 'identification envelope' you find on your desks are marked with the same number. This will remain your 'examination number' during the whole examination. Report immediately if the numbers on the sheet and envelope are not alike.

"Sign your full name upon the identification sheet, place the latter in the identification envelope, and seal it immediately.

"Do not write your name on any other envelope or paper used during the examination.

"Write your answers plainly immediately after each question.

"No applicant is permitted during any examination, in any manner whatever, to give assistance to any other applicant, or to receive assistance from any other person whatever, or to communicate with any person or to leave the room without a guard provided by the examiner or his assistant.

"As soon as you have answered all questions and performed all the tasks as far as you are able to do so, place all the sheets in the larger envelope marked with the same number as your examination paper and seal them up.

"After you have finished the work and complied with the above instructions, deliver to the chief examiner or his assistant, when passing out : (*a*) The identification envelope containing the identification sheet, sealed. (*b*) The large envelope containing the examination sheets with your answers and diagram sheet sealed.

"A violation of the rules will exclude the offender from the examination and from the eligible list.

"Journeymen plumbers will retain the tag with their examination number and attach same to their sample of plumbing work in the afternoon when completed."

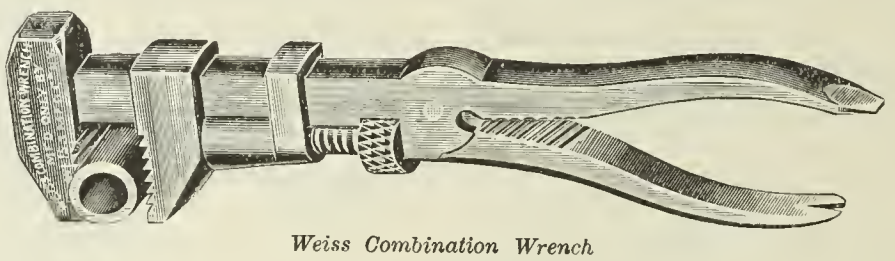
The journeymen plumbers were required to provide themselves with furnaces, soldering pots, wiping tools and other plumbing tools and material, and they were required to demonstrate their ability to do a plumbing job at the Central Police Station Building on Broadway.

The Thayer Heater Company Catalogue.

The front door of the Thayer hot water heater swinging on gold bronzed hinges forms the design for the front cover of the new catalogue of the Thayer Heater Company, Boston, Mass. The catalogue is devoted to the friction reducing Thayer heater and the friction reducing Thayer fittings. The typography and arrangement of the book are unique and attractive. After the title page is a half tone engraving of the Thayer hot water heater, followed by a novel table for comparing the virtues of furnaces, steam boilers and hot water heaters. The subject matter in the tables is discussed more fully in the pages which follow. Two pages contain quotations from the standard works on heating, among which is one from "The Metal Worker Essays on House Heating." Another section is devoted to "Ourselves," which completes the trend of the argument that the Thayer heater is a profitable investment. The few remaining pages give testimonial letters, show illustrations of the heaters and fittings and give data of interest to the heating contractor.

Weiss Combination Wrench.

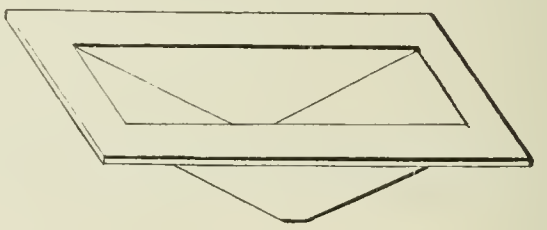
Allerton-Clarke Company, 97 Chambers street, New York, are marketing the Weiss combination wrench, here illustrated. It is 12 inches long over all, is made of drop forged steel and is designed to serve a number of purposes. It can be used either as a plain or pipe wrench and hammer. The upper of the two handles is a screw driver, the lower handle being a staple or nail puller. Wire can be cut by inserting it just to the right of the pivot on which the handle moves, while the corrugated surface seen on the handles is utilized for gripping articles as would be done with a plier. The tool may also be used as a hammer. The tool is polished and the goods are packed in wooden boxes.



Weiss Combination Wrench

The Dixon Brazing Crucible.

A newer process of brazing is threatening the old time flame method. That process is liquid brazing. Several years ago it was demonstrated that a specially treated joint, plunged into molten spelter, would not only braze in a very few seconds, but would, in addition, come out almost entirely free from scale, a brisk cleansing by a metal brush being about all the after treatment required. Briefly, liquid brazing consists merely in reducing the spelter to a molten form in a suitably shaped crucible at a high temperature, and then immersing the joint to be brazed in the liquid mass. The surfaces to be brazed are painted with a flux and the adjacent parts with an anti-flux.



The Dixon Brazing Crucible.

The Joseph Dixon Crucible Company of Jersey City, N. J., have placed on the market an anti-flux known as brazing graphite. On account of the high degree of heat required even the best of wrought iron vessels possess but a short life when used for melting spelter. To overcome this difficulty the above company have furnished several styles of graphite bowls, oblong crucibles and other special styles, but have now manufactured a crucible specially adapted for bicycle manufacturers. An outline sketch is shown herewith. It is 24 x 6 inches inside, the bottom forming an angle, being 10 inches deep in the middle. It has a 3-inch flange to support it in the furnace, and can be used in either coke, coal, gas or oil furnace. The shape makes it particularly suitable for brazing the crank hanger joints.

According to a report of United States Consul Sharp, at Hiogo, Japan, the rise in the price of commodities in that country becomes greater and greater every year. Compared with ten years ago, prices have risen 45 per cent., while wages have advanced only 39.2 per cent.

SHEET METAL WORK.

THE NEW YORK TRADE SCHOOL EVENING CORNICE CLASS.

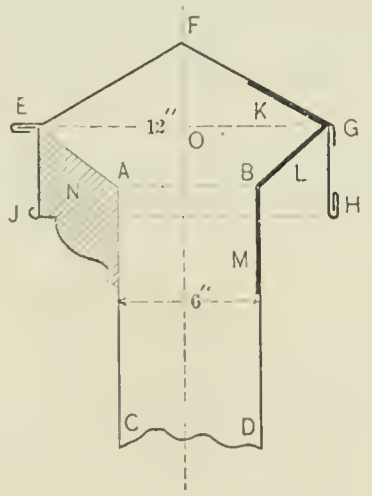
In another department we report the formal opening of the seventeenth season of the New York Trade School. We give below a list of the members of the Evening Cornice Class. This class has shown the popularity of this course of instruction by an increased membership :

Willis C. Acker, Yonkers, N. Y.
Louis Arthus, New York City.
Albert J. Becker, New York City.
Adolph Bender, New York City.
James Boyd, Jr., Brooklyn, N. Y.
John J. Brandreth, New York City.
Charles E. Brustman, Brooklyn, N. Y.
Richard H. Croad, Jersey City, N. J.
Frank Davis, New York City.
Michael Donlin, New York City.
Herman Haas, New York City.
Daniel J. Kuhn, Brooklyn, N. Y.
George W. Lindley, Brooklyn, N. Y.
William Mayer, Brooklyn, N. Y.
Albert Mitchel, Lyndhurst, N. J.
William P. Rice, New York City.
Abraham L. Ringle, Jersey City, N. J.
Jacob F. Schwoerer, New York City.
Louis Soeder, Brooklyn, N. Y.
Henry F. Soldinger, Brooklyn, N. Y.
George L. Woodburn, Brooklyn, N. Y.

PATTERN FOR PLAIN VENTILATOR.

BY W. N.

To avoid down drafts in chimneys, or smoke stacks, it is usual to place a plain ventilator or hood over them. One of the most simple forms of ventilators is shown in Fig. 1, in which A B C D is the stack, E F G the hood and G H or J E the collar placed ar ound the onter edge of the



Pattern for Plain Ventilator.—Fig. 1.—Sectional View.

hood if desired. There are two ways in making and fastening this collar.

One is to put a double edge at H, with a single seam at G and soldered, and the other, with a wire edge at J and double seamed at E. Four braces are usually employed to carry the hood, and can be made by means of band iron formed as shown by K L M and bolted, or galvanized iron stays can be used, as shown at N. The pattern for the hood is obtained by the shop rule—that is, take F G or F E as radius, and with any point, as A in Fig. 2, as center, describe the arc B C. Now set the dividers equal to E O or O G in Fig. 1, or one-half the diameter of the hood, and, commencing at B in Fig. 2, step off six spaces, as shown by B D E F G H C. Draw a line from C to A. and from A to B, which completes the net pattern for the

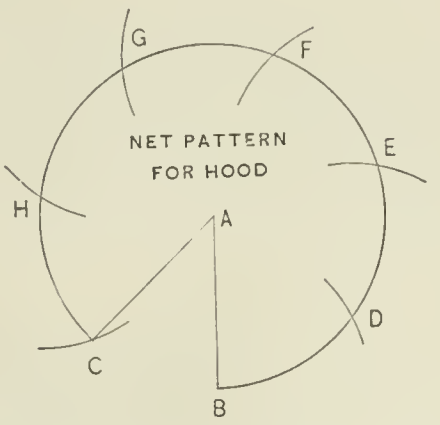


Fig. 2.—Method of Getting the Pattern.

hood. Allow for seams and edges. The size of the hood is governed by the size of the stack, the hood always being twice in diameter to that of the stack.

FLASHINGS.

The death is announced of Edward B. Lanman, manufacturer of Pressed Sheet Iron Work, Columbus, Ohio, after a short illness from pneumonia. Mr. Lanman was born at Norwich, Conn., in 1852. In 1867 he went to Columbus and entered the employment of McClune, Mithoff & Co., hardware dealers. In 1882 he started a manufacturing business of his own. At the time of his death he gave employment to 125 workmen.

The Bourlier Cornice & Roofing Company of Louisville, Ky., have been awarded the contract for the galvanized iron cornices, skylights, slate, tin and composition roofing for all the depots, section houses, round houses, machine shops and terminals, making a total of 142 buildings. The contract was made with M. T. Lewman & Co. of that city, who have the contract for the new M. & O. Railroad now being constructed between Tuscaloosa and Montgomery, Ala.

F. W. Stelling, Hartford, Conn., has in hand contracts for a large amount of metal work. He is now getting out the galvanized iron cornices, &c., for the new Walder Block, the cornices for G. Fox & Co.'s store, the galvanized iron work and ventilators for the new Hartford Brewery, and will do the tin roofing of the new car barns for the Hartford Street Railway Company on Vernon street. The latter job calls for 70,000 square feet of roofing, and is said to be one of the largest roofing contracts ever given out in New England.

The American Corrugating Company, St. Louis, advise us that they have recently added a number of improvements to their machinery for the manufacture of their American Metallic Lath, and that they are now in position to turn out all orders promptly, and that the improvements made have enabled them to double their output. We are advised that the lath made by this company comes from the machine in absolutely straight sheets, there being no curve to them whatever, thereby making it extremely easy to apply.

The Allen Anti Rust Mfg. Company, successors to Allen, Ackley & Co., 413 Vine street, Cincinnati, Ohio, have issued some interesting advertising matter relative to their Anti-Rust Japan, adapted for use on roofs and other places where it is desired to protect or preserve exposed metal work. Among the circulars which are being sent out are numerous testimonial letters from some of those who have used the Anti Rust Japan, the list including the War and Navy Departments and the Chickamauga, Chattanooga and Gettysburg National Military Parks.

TIN PLATES.

Humbert Tin Plate Company's Baltimore Works.

The tin plate plant of the Stickney Iron Company, at Baltimore, Md., recently leased for three years by the Humbert Tin Plate Company of Connellsville, Pa., was started into operation this week under the superintendency of Patrick Henry. The works are located at the southwest corner of Eleventh avenue and Clinton street, Canton, Baltimore. A track of the Pennsylvania Railroad runs into the property, and a private ferry owned by the Stickney Iron Company gives connection with the Baltimore & Ohio Railroad, cars being hauled on floats to the property. Facilities for shipment by water are also enjoyed. The plant was built in 1895, but owing to the depression in business at that time it was never put in operation. When built advantage was taken of improvements in methods of making tin plate, and the plant is regarded as one of the most complete and modern in the country. The capacity of the works is 1600 boxes of finished tin plate a week. The site of the works was formerly occupied by one of the Stickney furnaces, which was torn down to make way for the tin plate plant.

SCRAP.

A leaflet issued from the Pittsburgh agency of Wallace, Banfield & Co. of Irondale, Ohio, calls attention to the Irondale Old Style brand of Roofing Tin and recapitulates its points of merit. This Plate is coated with almost pure lead by the hand dipping process and is claimed to resist corrosion to a far greater degree than where a large proportion of Tin is used in the coating mixture.

The wash house operatives, of whom there are about 2000 employed in the Tin Plate mills dipping Terne Plates into the vats, have organized a trade union and applied for admission to the American Federation of Labor at their meeting this week, at Nashville, Tenn. The wash house men in Tin Plate works are not included in the Amalgamated Association. It is said that the majority of these workers in the Pittsburgh, Ohio Valley, Wheeling and Indiana districts have joined the new organization.

A correspondent at San Francisco, Cal., writes in regard to the Tin Plate trade of the Pacific Coast: "Tin Plate continues to come along by rail a carload at a time. There has been no arrival of foreign of any importance since my last advices. There is, of course, no special demand at this time of the year, and the market is dull."

It is reported by the Pittsburgh *Dispatch* that a large number of Welsh Tin Plate workers have come of late into that district. Owing to their familiarity with the work of Black Plate and Tin Plate manufacturing they secure ready employment. The complaint is made that in many cases where these men have been placed in charge of mills they have sent over for their friends in Wales and have made room for them by ousting American workmen. The feeling of dissatisfaction among the latter is stated to be very keen on this score. Numerous complaints are reported to have been lodged with the Amalgamated Association by men who have been forced out of employment to make room for Welshmen.

Julius A. Landsberger of the firm of J. A. Landsberger & Bro., San Francisco, Cal., is at present in the East, and will make his headquarters in New York City, care of Whitehouse & Co., 25 Broad street, until after the holidays. Messrs. Landsberger are the Pacific Coast agents for the American Tin Plate Company of Elwood, Ind.

The American Tin Plate Machine & Mfg. Company, Canal Dover, Ohio, who are running under the receiver, are turning out a special product of high grade Ternes and continuous Terne roofing. W. C. Brown, 36 La Salle street, Chicago, is Western sales agent. He reports flattering prospects for the company's Western business.

The Joint Traffic Association has announced the following change in the freight rate on sheet bars and tin plate bars: From Pittsburgh, Wheeling, Sharpsburg and Bellaire, Bridgeport and Martin's Ferry, Ohio, to Cumberland, Md., $1.15 per gross ton.

NEWS AND NOTES.

A dispatch from Victoria, British Columbia, states that between 20 and 30 river steamers are to be built at that port during the present winter. Among them is a steel steamer, which will operate on the Yukon, and also two vessels for the Hudson Bay Company.

With the view of checking the waste of natural gas which is going on in Indiana through prospecting and other operations in the oil fields, an injunction has been asked for by the State authorities against the Ohio Oil Company, who are made the defendants in the suit. This suit is regarded as a test case, and it is to be pushed to the Supreme Court with all possible haste. If a favorable decision is rendered by the court of last resort it is believed that it will be possible to stop the enormous waste of natural gas which has been going on in every part of the Indiana gas territory, to the detriment of the industries which depend upon that product for their fuel supply.

A syndicate of New York and Boston capitalists are reported to be making preparations to reopen the disused copper mines at Blue Hill, Maine. The syndicate, it is said, propose to operate these old mines, which have been idle since 1879, on a large scale. The old company who operated the mines originally were obliged to abandon them on account of the sharp competition from the Lake Superior mines.

The Westinghouse Electric Company of Pittsburgh, Pa., received last week a cablegram from Scotland to the effect that the municipality of Glasgow had awarded to them the contract for equipping the traction tramways and power houses of that city with electrical machinery. The Glasgow street railways are 70 miles in length. The Westinghouse Electric & Machine Company have also received a contract for a complete street lighting plant from Malaga, Spain.

Before sailing from New York last week on a tour of the world, George W. Vanderbilt took out a life insurance policy for $1,000,000 with the Mutual Life Insurance Company. This is by far the largest policy ever issued in the world, and it has created a vast amount of interest among insurance men.

The progress report of the Naval Construction Bureau shows that the battle ships "Kearsarge" and "Kentucky" are 49 per cent. advanced toward completion; the "Illinois," 35 per cent.; the "Alabama," 32 per cent., and the "Wisconsin," 28 per cent. The Princeton gunboat is 92 per cent. along; the submarine boat, 66 per cent., and the torpedo boats all the way from 98 per cent. in the case of the "Winslow" to nothing in the case of the three 30-knot boats to be built at Wilmington, Del., Seattle and Morris Heights, N. Y.

The receipts of the United States Post Office Department in November were heavier than those of the corresponding month in any previous year. For 50 of the large cities the gross receipts last month amounted to $3,527,868, or nearly 13 per cent. over November, 1896. This growth is regarded as an interesting evidence of the improved business conditions of the country.

Unusual activity is reported at the shipyards of Bath, Maine. Contracts have been placed within a few weeks with the local shipbuilders for 18 new vessels, with the result that the yards are busier than they have been for many years. The New England Shipbuilding Company have secured a contract to build three large barges for the Baltimore & Ohio Railroad, 200 feet long, with a capaity of 1600 tons each.

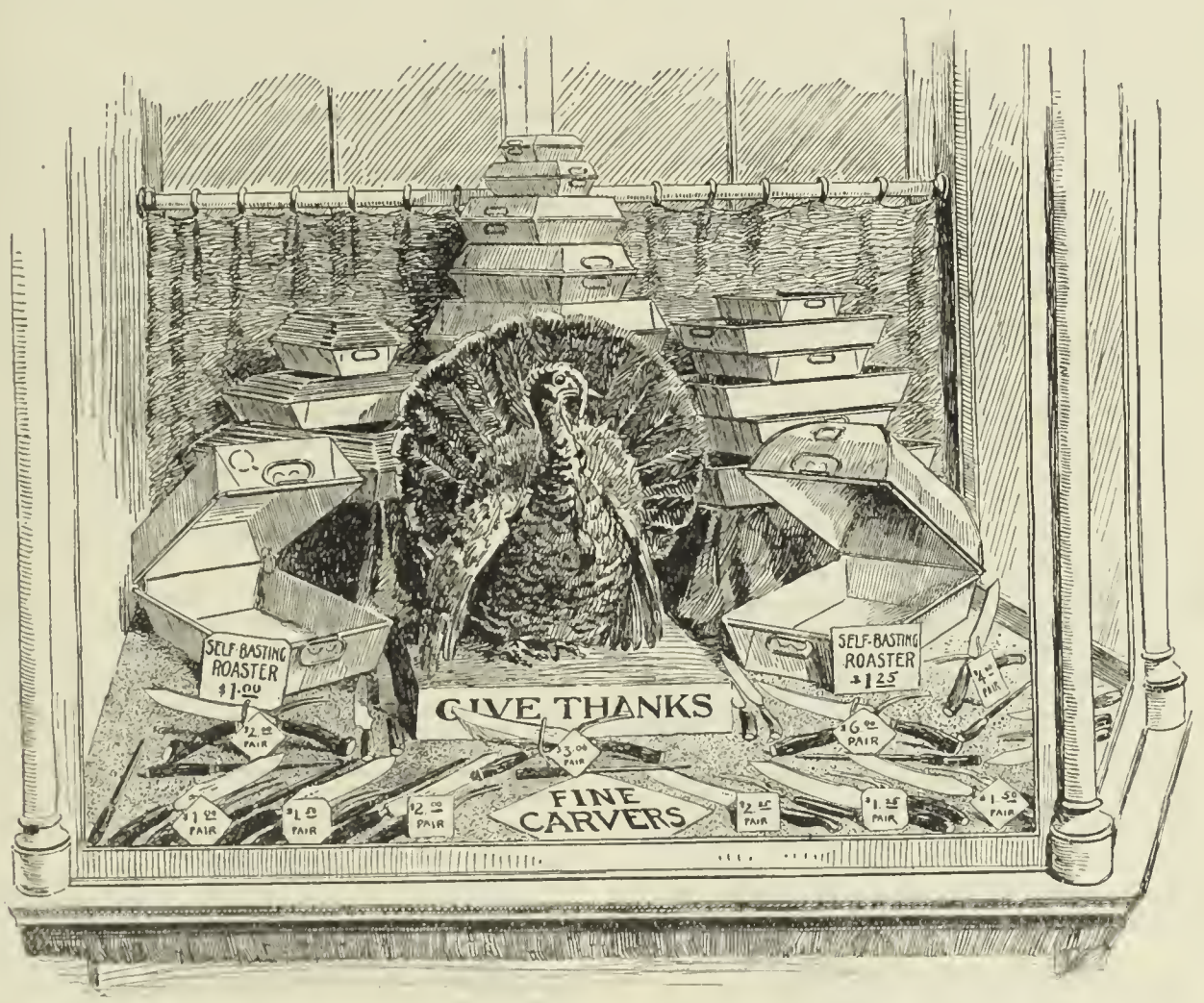
The construction of the proposed great Russian canal to connect the Baltic and Black Seas will, it is reported, be begun in the spring. The minimum water way of the canal will have a depth of 28 feet 4 inches, a width at the bottom of 116 feet 8 inches, and a width at the top of 216 feet 8 inches. Its total length is some 1000 miles, but only 125 miles will be an artificial channel. The route is from Riga along the Duna as far as Dunaburg. From that point to Lepel, on the Beresina, an expensive cut must be made. From the Lepel the course of the Beresina will be utilized as far as its junction with the Dneiper, and then the line will follow the latter stream to Cherson on the Black Sea.

THE RETAIL STORE.

Holiday Window Display.

Many retail Hardware merchants are much perplexed in arranging appropriate holiday window displays. At this time of year the temptation is stronger than ever toward placing a great variety of merchandise in the windows. This should be carefully avoided A few lines well displayed will make a much stronger impression than a great variety. Neatly lettered price tickets and window cards add materially to the effectiveness; that is, if the prices are what they should be. It is probably more important at this time of the year than at any other to change displays frequently.

The window illustrated presents a Thanksgiving display, but it is obvious that with very slight modification the exhibition may be adapted to the Christmas holidays. Securing a large turkey gobbler, the skin of the bird is stuffed and mounted, and placed in a window where the principal display consists of Carving Sets and Roasters. Any good taxidermist will mount the bird for a nominal fee. The gobbler should be placed in the center of the window, where he will show to good advantage. It is well to set him on a level plane somewhat above the floor of the window. The Carving Sets should be carefully arranged around him on the sloping floor. It is often a good plan to mark each set plainly with the price. The Roasters and Dripping Pans can be arranged to form small pyramids on each side of him. They can also be displayed from shelves and brackets upon the side walls. All the good talking points of the various articles should be brought out as strongly as possible in the display. To this end neatly lettered window signs may be employed.



Holiday Window Display.

H. L. Judd & Co., 87-89 Chambers street, New York City, have issued a catalogue which is likely to prove of interest to dealers handling brass and onyx tables and lamps, bric-a-brac stands, pedestals, &c. The catalogue is made up of 48 pages, profusely illustrated, and shows in a comprehensive way some of the many lines manufactured by this concern. In addition they turn out Upholstery Hardware, Shade and Carpet and Picture Hardware, Stationery Hardware, Brass and Iron Bedsteads, Brass Photograph Frames, Mirrors and other fancy goods, Wood and Brass Curtain Poles and Trimmings and Display Fixtures.

Challenge Refrigerators.

The handsome catalogue of the Challenge Iceberg refrigerators, issued by the Challenge Corn Planter Company, Grand Haven, Mich., gives a great deal of information both pictorially and by printed text which will interest the dealer in refrigerators. The book is oblong shape, is handsomely bound in red and contains over 90 pages, nearly every one of which is illustrated with one or more engravings of some form of refrigerator. The majority of the engravings are half tone and are beautiful presentations of the handsome line of Challenge goods. In some cases the doors are all open, revealing the interior arrangement, while in other cases the appearance of the refrigerator is shown by an outside view, clearly indicating its decorative features. Prices, brief descriptions and tables of dimensions are given with the cuts, while in the introductory pages a sectional view illustrates the design of the refrigerators, and descriptive particulars are given of its several details and features of its finish. On the front cover in a panel is printed the following : "This catalogue cannot talk. It will open up or shut up at your pleasure. It will not lie or deceive you. Photographs tell the truth. Make its acquaintance, buy the whole line and you will make no mistake."

The Adams Stove & Hardware Company of Kansas City, Mo., have been incorporated, with a capital stock of $5000, by Louella Adams, Edwin N. Adams and Louisa Adams.

The Influence of Holidays Upon the Hardware Trade.

BY C. F. C.

Hardwaremen are noting more and more the effect of the various holidays upon their business. The time was when Christmas trade in a Hardware store varied only a little from the regular run. To a great extent this was true of all other holidays as well. Today the average merchant looks for an increased trade at such times, and he generally gets it.

This change of affairs is largely due to the influence of good advertising. Then, too, the buyers have lately made greater efforts to obtain goods appropriate to the various holiday seasons. That's the old plan of backing good advertising with the right kind of goods. The right kind of advertising with the right kind of goods back of it is always remunerative.

Hardware Christmas Gifts.

There are many things in the Hardware store which make useful and pretty Christmas gifts. These things should be pushed to the front in the store and in the advertising. It pays to do it. The general public has not yet come to think of a Hardware store as a place for Christmas shopping. The best way to impress this idea is by advertising. Carpet Sweepers, Pocket Knives, Carving Sets, Skates, Silver Plated Ware, Agate Ware, Nickel Plated Goods, and many other articles of Hardware merchandise make handsome presents. At the same time those things are comparatively inexpensive. These points should be strongly brought out in the advertising.

A New Firm's Experience.

Three or four years ago a new firm purchased an old established Hardware store. The new proprietors took possession about the middle of October. They found many lines of goods badly depleted, while others were greatly overstocked. To the latter class belonged a line of Carpet Sweepers of a well-known make. One member of the firm thought that there were enough to last two years, but both members agreed that they should be disposed of in much less time. Early in November they commenced to devote their advertising space in the various papers entirely to Christmas advertising. Everything in their stock that would make a suitable present for any one was given publicity. In nearly every advertisement Carpet Sweepers were given room. On Christmas morning only two Carpet Sweepers remained in the store. In less than two months this new firm had sold more Sweepers than the old firm usually sold in a year. The average daily sales increased greatly during two weeks before Christmas. The result of the effort to get a share of Christmas patronage was so satisfactory that the firm have decided to make greater efforts along this line each year.

Frequent Window Displays.

During this period the window displays were changed frequently. There were always articles displayed which would aid and uphold the newspaper advertisements.

As it is with Christmas advertising, so it is to a great extent with other holidays during the year. At Thanksgiving time, before the Fourth of July, and during the season of any public demonstration, appropriate goods should be pushed.

Advertising Opportunities.

Perhaps there is to be some local celebration, or the local football or baseball team is to play a series of games. All such things as these give additional opportunities for effective advertising. These events should be mentioned in the advertising, and some article that is especially adapted for use on such occasions should be advertised. This plan not only advertises the store, but it advertises the event, whatever it may be. The more people that can be influenced to turn out on such occasions the more chance the merchants have of making sales.

Reciprocity.

The people who are directly interested in such events will know who helped to advertise them. This in itself is a good advertisement, for it makes friends for the firm, and out of friendship much patronage is obtained.

The window displays at such times are valuable advertisements. If there is to be a game of any sort in which a local team is to participate, trim the windows with the team colors and display articles which are useful at such times. If any society is to have a demonstration, make their emblem the central attraction in the windows. Such things attract attention, and to attract attention is the first mission of any advertising. Any firm that persists in such things as these will soon gain the name of being enterprising and public spirited. Such a reputation is an enviable one, and it pays to have it.

Outdoor Advertising.

At such times as these it often pays to use outdoor display, but it should be borne in mind that outdoor advertising, to be profitable, must be of an entirely different nature than the newspaper advertising. Outdoor advertising must be concise, that it may be read and understood at a glance. Very few details can be mentioned. Large plain lettering is a necessity. If any of the newspaper advertising must be sacrificed in order to use outdoor display it had better be left alone.

There are many different methods of outdoor publicity. As in other classes of advertising, some of these methods are better than others. For the present it will be well to mention only those which are useful during parades, ontdoor games, &c. These are almost too numerous to mention, but a few of them will not be out of place.

During a celebration of great public interest sonvenirs are good advertising. Such advertising should consist of something that is really valuable as a keepsake. Articles which are cheap and unattractive are thrown away after a glance, and remain to be trampled under foot.

In districts where the "sandwich man" idea has not been overdone this plan will pay. This person should be dressed in some unusual costume, and the advertisements which hang from his shoulders must be concise and attractive. Such a person circulating through a crowd will always be noticed.

The manufacturers of a well-known bicycle lamp have a coach built exactly like one of their lamps, which is driven about through the crowds and in front of the grand stand at race meets. Such a thing as this would be too costly for the retailer, but, nevertheless, many ideas can be derived from it. An ordinary delivery wagon, decorated with club colors, would attract attention and prove a good advertisement in most of the smaller cities. Of course it should be clean, and the firm name should not be hidden with the decorations.

A large, distinct sign permanently set upon an athletic field has its value. This value is enhanced if the sign is cared for and the wording changed when the boards need repainting. When such signs are small and huddled together with several others, much of their effectiveness is lost. White letters upon a black background stand out better and can be read further than black letters upon white. It requires a little more work to paint the former than the latter. Some persons paint the whole sign one or two coats of white, then mark out the letters, and fill in the background with black. Another plan is to lay out the letters on the boards and paint both the black background and the white letters at the same time. The latter method is much quicker, as there are no waits while the various coats are drying. In many Hardware stores such signs as these are made and painted during the dull months. If there happens to be no good letterer in the store a local sign painter should be hired to make a heavy paper stencil, with the aid of which any of the clerks can mark out the letters on the boards. When the signs are large the stencil must necessarily be in several pieces.

In outdoor advertising, as well as in any other kind of publicity, one must be careful not to "pay too much for his whistle." All advertising has value, but many merchants pay for some branches of it much more than it is worth to them.

The Projected Enameled Ware Consolidation.

The negotiations looking to the consolidation of a number of the leading enameled ware and stamping companies are still being actively prosecuted. A further meeting of representatives of these interests was held this week in Chicago. It is understood that some of the difficulties surrounding such a combination as is aimed at have been cleared away. At the same time, it is definitely stated that no actual agreement of any kind has as yet been arrived at. The whole matter is still in an embryo condition. A number of companies engaged in this line of business have been communicated with, and the project has been discussed very fully. But the interests involved are so complex that even if the proposed plan of consolidation is carried out it will take considerable time to perfect a working agreement.

Among the companies said to be considering the scheme are the St. Louis Stamping Company of St. Louis, Mo.; the Central Stamping Company of New York City the American Stamping Company of Brooklyn, N. Y.; the Bellaire Stamping Company of Harvey, Ill.; Matthai, Ingram & Co. of Baltimore, Md., and Kieckhefer Bros. Company of Milwaukee, Wis. The Iron Clad Mfg. Company and the Haberman Mfg. Company of New York are also mentioned as likely to be included in the consolidation, but neither of these firms are believed to have yet signified their willingness to join. Ex-Congressman Frederick G. Neidringhaus, president of the St. Louis Stamping Company, who is the leading spirit in the movement, returned this week to St. Louis after a prolonged visit to New York, Baltimore, Chicago and other points, in the course of which he met and conferred with representatives of all the principal enameled ware and stamping concerns

Leading officials of some of the large concerns named above who have been seen state that the idea of the consolidation of interests is not to advance prices, but to economize in the cost of production and to reduce the cost of selling their goods by marketing them through one central agency. Competition would still have to be met, as several concerns making enameled ware, among which are some of the most important, are not interested in the present project. The statement, freely made in the daily press, that the capitalization of the consolidated company would be about $25,000,000 is declared by those interested to be preposterous. At the utmost, if all the concerns whose names have been mentioned came in, the combined capital represented would hardly reach $10,000,000.

Hardware Want Book.

Simmons Hardware Company, St. Louis, Mo , will, on application, mail free of charge to any dealer in any of these lines of goods a very convenient want book, which embodies some unique features. It is 9 x 4½ inches in size, has 110 pages and a flexible cover. Opening and closing pages to the number of 15 call attention to leading features of their business, but the remainder of the book is ruled for the use of the dealer to note his wants as they occur, thus making a convenient and efficient record from which to order. At the bottom of each page are excellent business maxims. A few of them are given below:

Would it not pay me better to be in the front part of my store and mingle with my customers, instead of shutting myself up in the back office among my books ?

Is not quality remembered long after the price is forgotten ?

Was it Christian in me to keep a "drummer" waiting around all day when I could have disposed of him in 15 minutes ?

Can I continue to pay my bills promptly unless I require prompt payment from my customers ?

Wouldn't it be a good idea for me to put in goods to sell every season of the year so I will have no dull periods ?

Will the profit I lost on goods I was "out of" ever come back ?

Why should not a Hardware store enjoy a good Christmas business ? What did I carry in stock last year to sell to the Christmas trade ?

Does the special man, who gave me an extra 5 per cent. on the gross of Hair Curlers, think of me as often as I think of him ?

Would it not be just a little bit suspicious if all jobbers' prices were the same on everything ?

Ninety per cent. of all the failures in this country are caused by "credit," particularly indefinite credit.

"Slow collections" is the usual obituary notice of a failure in business.

Short accounts make long friends.

Buy what you need and nothing else, and in quantities to suit.

Go after trade and don't wait for it to come after you.

Always get your money before you spend it.

He who is most slow in making a promise is most faithful in keeping it.

When you order an extra large quantity underscore the quantity.

Violation of trust to day, lack of standing to-morrow.

To live within your income means happiness, otherwise misery.

Politeness is the cheapest capital in the world, and pays the longest dividends.

Don't kick first. Ask questions. Your impression may be wrong.

A grasp of the hand and a pleasant smile often sells a bill of goods.

Avoid promises—they are thin ice and dangerous.

Is it better for me to buy a small variety in large quantities, or a large variety in small quantities ?

Some farmers buy everything on credit, but sell all they produce for cash—"great heads."

Energy is an absolute requisite for business success.

Do your work every day—don't put off. Procrastination is the thief of time.

Don't keep your good nature down in your boots. Hang it outside where people can see it and be happy for it.

Another Chicago Hardware Sensation.

Chicago is springing surprises on the Hardware trade these days. Hardly had the discussion of the retirement of John Alling & Co. ceased when Horton, Gilmore, McWilliams & Co. concluded to withdraw from business. They decided to quit on the 7th, when, after a conference with Hibbard, Spencer, Bartlett & Co., the latter agreed to purchase the entire stock of merchandise which the former had on hand. Subsequently an assignment was made to the Illinois Trust & Savings Bank. It is stated that this peculiar course was taken for the purpose of speedily settling the affairs of the house and realizing, if possible, dollar for dollar of the indebtedness. The liabilities of the firm are placed at $210,000, and the assets at $300,000. The latter consist of $150,000 in outstanding book accounts and the sum expected to be realized from the sale of merchandise to Hibbard, Spencer, Bartlett & Co., which will be turned over to the assignees.

The business of Horton, Gilmore, McWilliams & Co. has been in unsatisfactory shape since 1893, and profits have been so small in the Hardware trade that the recovery this year could not make up the previous deficiency.

Debts have been pressing which could not be met. It was therefore decided to go into voluntary liquidation with as little trouble as possible to the members of the firm and to creditors. The sale of the merchandise to Hibbard, Spencer, Bartlett & Co., which was done on private terms, is said to promise much better results for the interests involved than if the stock should be disposed of under judicial proceedings.

This action terminates the existence of one of the oldest Hardware houses in the Northwest. It was long known as William Blair & Co., having been founded by William Blair in 1842. On January 1, 1888, Mr. Blair retired, and his partner of many years' standing, James M. Horton, organized a stock company to carry on the business under the name of Horton, Gilmore, McWilliams & Co. The new owners did a flourishing business for some years, but appear to have received a shock in the depression following the panic of 1893 from which they could not recover. The members of the firm have the profound sympathy of the trade.

The house of Hibbard, Spencer, Bartlett & Co. gains added prestige from this absorption of another rival. The wholesale Hardware trade of Chicago is now concentrated in very few hands. But while their competitors drop out of the race the business of Hibbard, Spencer, Bartlett & Co. steadily grows and their influence correspondingly increases.

C. Sidney Shepard & Co.,

Chicago, are establishing a branch house at 1408 and 1410 West Eleventh street, Kansas City, Mo., and expect to have it in running order about January 1. They will carry a full line of their own goods and a complete stock of sheet metals, enabling them to make prompt shipment on hurried orders. A railroad track extends into their warehouse, thus giving them the best possible facilities for receiving and shipping goods. The branch house is well located in all respects to handle Western and Southwestern trade.

MEMORANDA.

The Hill-Whitney Aluminum Company, 90 Canal street, Boston, Mass., manufacturers of Aluminum Kitchen Ware, will early in 1898 transfer their manufacturing department from Fair Haven, Vt., to Waltham, Mass.

William J. H. Gluck, 218-222 North Gay street, Baltimore, Md., has issued some advertising matter in the shape of circulars and a pamphlet calling attention to the extensive assortment of goods which he manufactures of interest to Stove and Tinware dealers generally. The pamphlet illustrates what are designated as spring specialties, these including Nursery Refrigerators, Gluck's New Steam Cookers, the Standard, King, May Queen and Gluck's Non-explosive Oil Stoves, all of which embody interesting features of construction; new patterns of Ovens for Gasoline, Gas or Oil Stoves offered in 26 sizes, and a varied line of Table Gas Stoves, or Hot Plates, as they are sometimes called, these being offered under such names as Liberty, Fire Queen, Star and Sunshine. Attention is also given to Gasoline Stoves and to an extensive line of Tinware, Water Coolers, Oil Radiators, Cuspidors, Fruit Cans, Coffee Pots, &c. The circulars call attention to a Christmas assortment of Gray Enameled Ware and also to the Wood Air Tight Heating Stove.

The Eclipse Cleanable Dry Air Refrigerator is the subject of a little illustrated price list issued by the Eclipse Refrigerator Works, Burlington, Vt. The main features of this construction are explained, while illustrations show its various styles and tables give sizes and prices.

Wm. Bowler has just completed the erection of a new three-story brick building at Atlantic City, N. J. The structure is 32 feet wide and 125 feet long. It is, we are advised, a modern establishment in every respect. Mr. Bowler handles a varied line, including Hardware, House Furnishings, Paints, Oils, Ship Chandlery, &c., and also conducts a plumbing and heating department.

W. C. Cowles, retailer of Shelf Hardware, Stoves, Tinware, Sporting Goods, &c., Scranton, Pa., will in March next move to a new building which is now in course of erection. The building is 24 x 70 feet, three stories and basement. It will be lighted with electricity and have other modern appointments

The Hudson Fruit Parer Company, Leominster, Mass., are putting on the market an improved parer, corer and slicer called the Daisy, which, they state, will operate successfully on large or soft fruit. The machine is described as being well made of the best materials, light and easily handled, and they state that it can be sold at a reasonable price. The fork and slicing knives are tinned so that the fruit will not turn black. The machine is illustrated in a small pamphlet which has been prepared for the hardware trade.

H. R. Brasfield & Co. will succeed H. R. Brasfield & Brother in the Hardware, Stove and Implement business in Unionville, Mo., February 1, 1898.

H. T. Boynton has decided to get out of the Stove and Tinware business in Westbrook, Maine.

Warren's Compartment Cabinet.

J. D. Warren Mfg. Company, Marine Building, Chicago, are putting on the market, in connection with their portable hardware shelving, compartment cabinets, shown herewith. The front of the compartment has a tilting

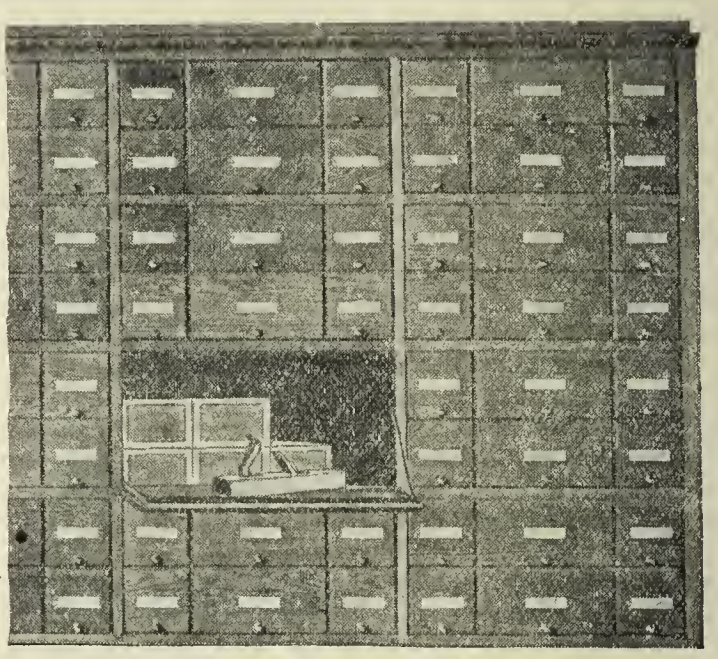


Fig 1 — Warren's Compartment Cabinet.

facing that is quickly lowered and forms a strong shelf on which goods may be shown. This arrangement is referred to as preventing mixing different goods, which, it is pointed out, occurs when placed on a counter, also having

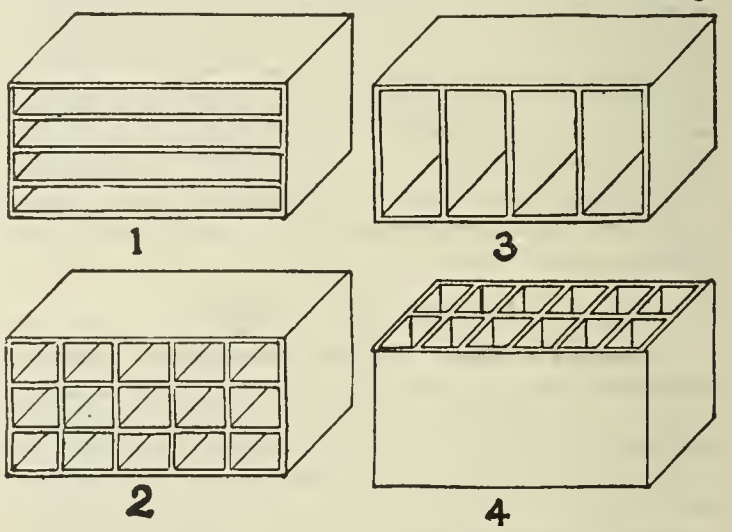


Fig. 2.—Chests for the Compartments.

the additional advantage that if the salesman is hurried any other salesman will find the goods on the shelf or in the compartment in which they belong. The cabinets were made for the convenience of merchants who wish to carry goods in the original packages so that goods of any certain kind or class may be kept in a certain space by themselves, to prevent mixing of stock and having a place for each class of goods, facilitating the finding of those goods. For instance, hammers can be carried in one compartment, hatchets in another, braces in the third, &c. The exterior of the drop shelf is finished to give the appearance of drawers, which, it is remarked, looks much richer than if the drop shelf was plain. Inside of the compartments various designed chests with pigeon holes and shelves can be placed, as shown by outlines in Fig. 2. For instance each shelf of 1 will hold 12 sizes of bits, so that 48 different sizes can be carried in one compartment, systematically arranged. Other goods can be conveniently kept separate in a similar way in this and the other chests. Cabinets with wooden drawers will be furnished if desired. The cabinets are 8½ feet in length, and of such hight that when resting on the base they can be conveniently reached from the floor.

STOVE TRADE NOTES.

TRAVELING STOVE SALESMEN FOR 1898.

The Co-operative Foundry Company of Rochester, N. Y., have arranged with the following salesmen to represent their interests during the year 1898 and to travel in the territory indicated: S. R. Sills in Western New York and Pennsylvania, C. C. Young in Central and Northern New York, George Low in Eastern New York and the New England States, H. Ganetsee in Ohio, Indiana and Michigan, C. B. Kelly in Pennsylvania, Maryland and Virginia, and J. B. Sperry in Southern Michigan.

The Walker & Pratt Mfg. Company of 31 and 35 Union street, Boston, Mass., will be represented by A. J. Holt and Arthur G. Place, who will visit the trade in the New England States.

The Howard Stove Company of Beaver Falls, Pa., will have their interests looked after by William M. Ewing, who will travel in Pennsylvania, Ohio and Indiana.

Charles C. Heath & Co. of Baltimore, Md., will be represented on the road during the ensuing year by Samuel Snyder, who will cover Virginia, West Virginia, North Carolina and Georgia, and Carey A. Moore, who will travel in Maryland, Pennsylvania, Delaware and New York.

The Somerset Stove Foundry Company of Somerset, Mass., will be represented by F. E. Grinnell and Frank W. Hawley, who will visit the trade in the New England States.

The B. C. Bibb Stove Company of Baltimore, Md., will be represented by W. H. Jones, who will cover South Carolina, Georgia and Florida; W. B. Hargrave, who will visit the trade in North Carolina, Virginia, Maryland and Delaware; and F. R. Eldridge, who will call on dealers in the cities of Baltimore and Washington and in parts of Pennsylvania.

The Mount Penn Stove Works of Reading, Pa., number among their traveling staff Ernest E. Reinking, who will cover Eastern Pennsylvania, New Jersey, Maryland, Virginia and New York; B. Frank Neudoerffer, who will visit in Western Pennsylvania, Ohio, West Virginia and New York, and George Uniacke, who will look after the trade in Philadelphia and vicinity.

The Marietta Mfg. Company of Marietta, Ohio, will be represented on the road by Alla Winsor, who will travel in a portion of Ohio, West Virginia and Maryland.

The Indianapolis Stove Company, Indianapolis, Ind., have made arrangements to have L. W. Clayton represent them in Illinois, William W. Clayton in Indiana and J. P. Lowry in Eastern Indiana and Ohio.

The Standard Stove Works of Fort Payne, Ala., will have their interests looked after the ensuing year by A. D. Atwood, who will travel in Alabama, Mississippi, Louisiana and Texas; H. C. Ryall, in the Atlantic Coast States, and B. E. Rainey, in Tennessee, Kentucky and the Middle States.

The Estate of P. D. Beckwith, proprietors of the Round Oak Stove Works, Dowagiac, Mich., have a large traveling force, which will look after their interests on the road during the ensuing year. Dyke V. Keedy will cover New York and the New England States; W. T. Leckie will travel in Michigan and Indiana; George T. Adams, in Wisconsin, Minnesota and the Dakotas; R. R. Elliott, in the State of Illinois; John L. Parker, in Iowa; Charles E. Starrett, in Kansas and Nebraska; W. N. Sawyer, in Missouri, Colorado and the Pacific Coast States; H. L. Mosher will cover Ohio and will look after special furnace work; Theodore C. Perry will also attend to special furnace work, while O. G. Beach will act as sales manager.

Hess, Snyder & Co., Massillon, Ohio, will be represented by A. L. Snyder, who will travel in Eastern Ohio and Pennsylvania, and F. E. Hess, who will cover Western Ohio and Indiana, also a part of Illinois.

The Foster Stove Company of Ironton, Ohio, will be represented by W. H. Foster, who will visit the trade in Ohio, Virginia and West Virginia; E. E. Tibbetts in Indiana, Tennessee and Mississippi, and Charles Marting in Kentucky and Tennessee.

The Rock Island Stove Company, Rock Island, Ill., have arranged with the following salesmen to look after their interests the ensuing year: A. D. Sperry, O. Leonard, S. D. Cleland, A. B. T. Moore, A. C. Colton, M. L. Morehouse and E. B. Waterman. The territory has not been fully assigned.

George W. Eddy.

George W. Eddy, at one time a prominent stove manufacturer of Troy, N. Y., died at his home in Waterford, this State, on December 5, in the eighty-seventh year of his age. He was born at Wethersfield, Vt., in 1811, and in 1830 went to Waterford, where he engaged in the manufacture of printers' ink, which had an extensive sale not only in the United States but also in Canada. Being a man of great business energy, he erected large stove works in the year 1847, where he also turned out car wheels and general machinery, and later the well-known Eddy valve and fire hydrant, of which he was the inventor. After more than 40 years of active business life, during which he gave employment to a large force of men and added greatly to the business interests of the village, he retired to private life. Mr. Eddy was not only a man of much inventive genius, indomitable energy and special business ability, but was large hearted and generous.

From the beginning to the end of the Civil War his house was noted as being the headquarters for the preparation and sending forth of supplies for the Christian and Sanitary commissions, and to this work he contributed largely. Mr. Eddy was a member of the First Presbyterian Church of Waterford and also one of its trustees.

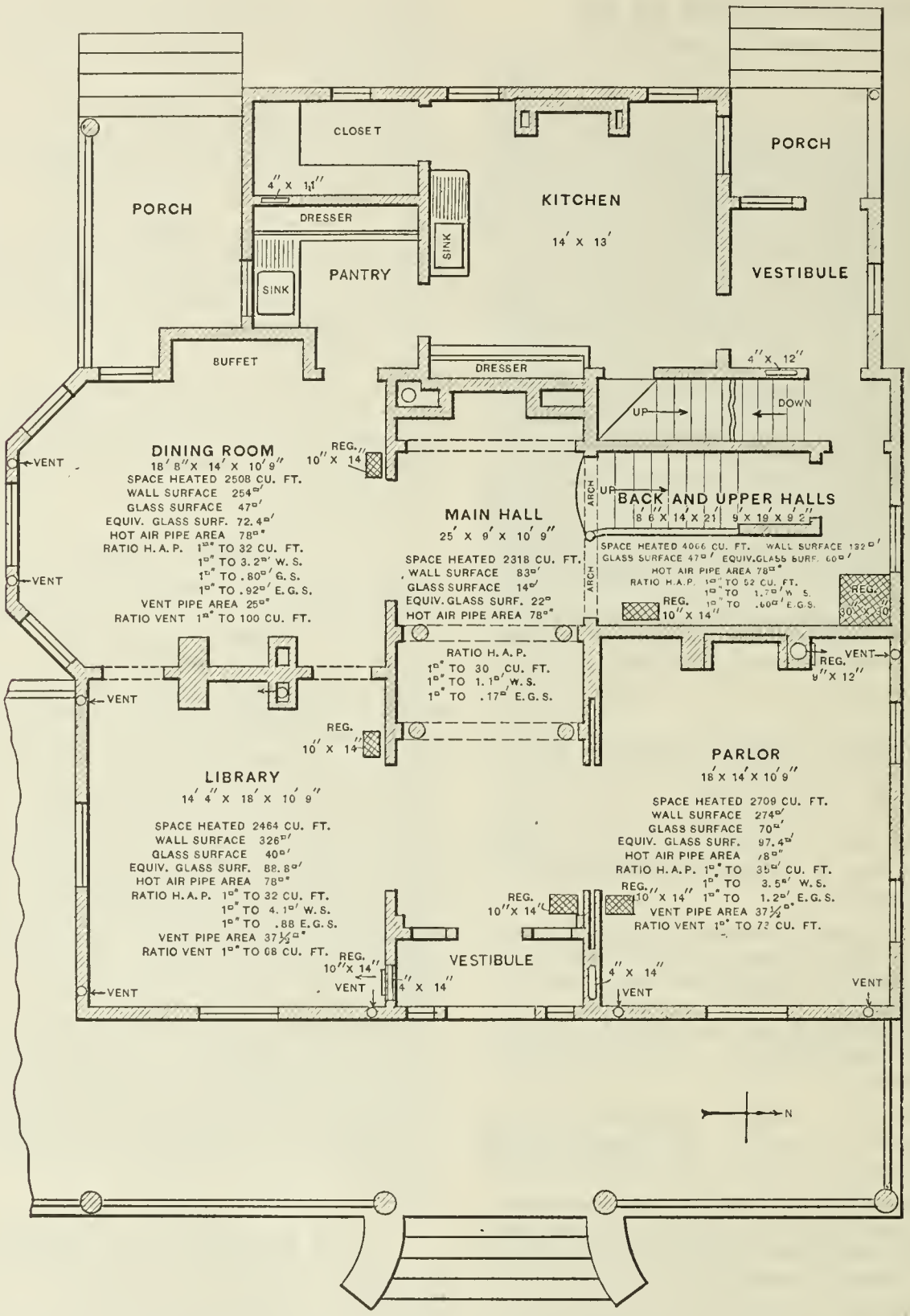
The Buckwalter Stove Company,

Royersford, Pa., have just issued a third edition of their treatise, "Heat and Ventilation," in which they also discuss the merits of their Eclipse furnaces. The principles of hot air heating are, in the treatise, expounded in a manner calculated to impress on the minds of those most ignorant of the subject the essential qualities to be looked for in a heating apparatus and their relation to health and comfort. The reader, having been shown the advantages of heating by hot air, has his attention drawn to the Eclipse Duplex, Eclipse, Eclipse, Jr., and Storm furnaces made by the company. The different parts of these furnaces are illustrated so that dealers and users can at once see the points of merit claimed for them. Under the heading "Short and Juicy Facts for Dealers" the features of the furnaces of special interest to dealers are prominently displayed and the advisability of carrying the line urged. At the end of the book is a collection of tables, a lot of information valuable to the furnace trade and numerous testimonials from users of the furnaces. The book is well printed on good paper and bound in yellow paper covers bearing a special design on the front.

A VENTILATING SYSTEM IN CONNECTION WITH A FURNACE.

During last winter there was in operation in the residence of J. P. Watson, Flatbush, L. I., a system of ventilation invented by William Willer, and used in connection with a No. 52 Thatcher furnace, manufactured by the Thatcher Furnace Company, 240 Water street, New York, who are placing this system of ventilation on the market, having secured the patent rights. It has been noted in the operation of this heating plant that the air flows readily through the pipes leading to distant rooms. This is said to be due to the fact that the air is removed from the room to make room for the incoming warm air through several 4-inch ventilating pipes connected with small registers in the base boards. These ventilating pipes run to the cellar and connect into a larger pipe used in connection with the smoke pipe of the furnace. By this means, it is claimed, the influence of the wind outside on the indoor air currents is practically overcome. It is further pointed out that in addition to the ventilation or change of air which alway accompanies the heating of any building with hot air furnaces, further ventilation and a more rapid change of air is effected by means of the exhaust ventilators.

The building in which this system is used faces due east, and the plan given in Fig. 1 shows the arrangement of the first floor, from which it will be seen that the registers used for heating are placed in the floor and the location of the exhaust or vent pipes is indicated by round pipes in the outer walls, with arrows and the word "vent" to make their location more clear. The ventilators are placed in the outer walls to remove the air which is naturally cooled by the exposure and to get it out of the room before the atmosphere is chilled and allow the incoming warm air to flow to the point of exhaust and keep an even temperature throughout the apartment. The second floor plan is given in Fig. 2, from which it will be noticed that the principal rooms are heated by means of round pipes, provision being made to secure pipes of this shape owing to the freedom with which the



A Ventilating System in Connection with a Furnace.—Fig. 1.—Plan of First Floor.

air flows through them. In the parlor chamber and library chamber there is also a 4 x 14 partition pipe brought up to aid in the heating. Partition pipes are used for heating the bathroom and the kitchen chamber. The 9-inch pipe used for heating the library chamber is reduced to 8 inches in size immediately above the top of the register and carried to two chambers in the attic. The front attic chamber is 12 x 22 x 9 feet 2 inches in hight and contains 2420 cubic feet, while the rear chamber is 17 x 9½ x 9 feet 2 inches and contains 1476 cubic feet. A damper is placed in the pipe leading to these rooms so the ash pit of the furnace. In the box a damper is placed, connected with the flap of the check draft, and in the pipe between the box and the opening in the ash pit of the furnace is a tight damper which may be closed when ashes are being removed from the fire. The chamber receives a 10-inch pipe into which the various small ventilation pipes from the rooms are connected The draft slides in the front of the furnace with this system need to be opened very seldom, as the air for increasing the fire comes into the chamber through the 10-inch vent pipe, as shown in Fig. 4, and passes down into the ash pit, by this means

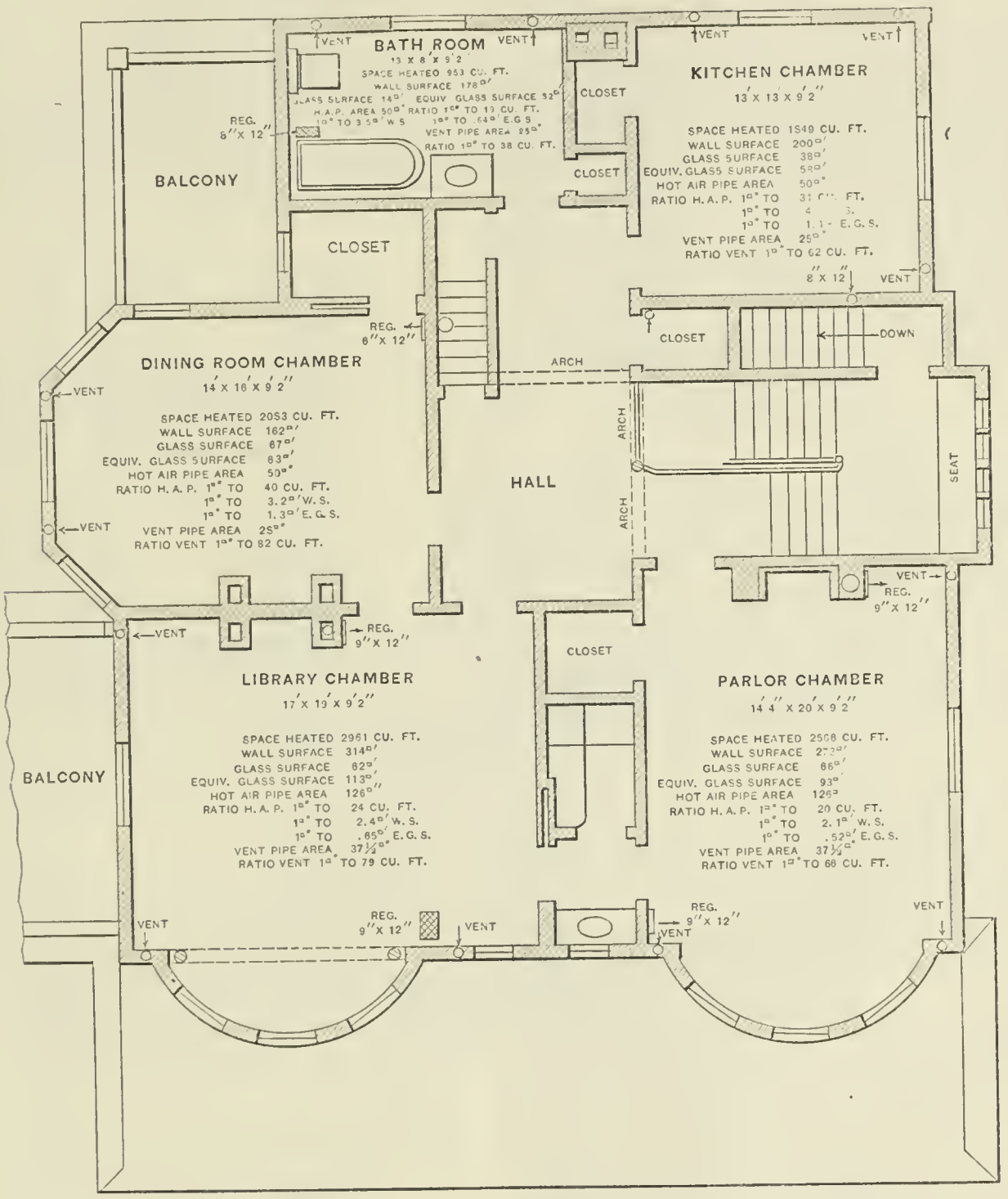


Fig. 2.—Plan of Second Floor.

that all of the hot air can be kept on the second floor when desired.

Fig. 3 is a plan of the basement showing the location of the furnace and the hot air pipes leading to the various rooms, and also the method of connecting the ventilating pipes with the furnace. Fig. 4 is a sectional elevation showing the method of connecting the return pipe from the ventilating system with the furnace and smoke pipe. It will be noticed that the smoke pipe on leaving the furnace passes through a large chamber made of sheet iron, and that the smoke pipe has a damper connected with the check draft so that when the flap of the check draft is raised a damper in the pipe is closed with the exception of an opening through which the gas may escape. It will also be seen that this chamber is connected to a box and keeping a good fire, and a strong exhaust is effected in the vent pipes. When the fire must be checked, by opening the flap on the furnace check draft the damper at the ash pit connection is closed and the air rushes into the smoke pipe, checking the fire, and through the heat of the chimney and the gases which are continually escaping a strong exhaust is effected.

The furnace is supplied with cold air through a 14 x 46 inch pipe leading from the north side of the building to a pit under the furnace. This duct is provided with a tight damper, and into one side of this duct another duct of the same size leads from a 30 x 30 inch square register placed in the floor of the back hall, as shown in Fig. 1. This duct is also provided with a tight damper. By this arrangement when a fire is started and

the building is cold the air in it may be circulated in order that the heating of the building may be more quickly accomplished. This method of supplying the furnace with air and revolving the air of the building is also available in extremely cold weather, when to take the air from out of doors would tax the heating capacity of the furnace. It will be noticed that the capacity of the cold air ducts is 644 square inches, and that the furnace has 12 hot air pipes leading from it having a combined area of 636 square inches.

ing room and dining room chamber connect into an 8-inch pipe, and the vents from the library and library chamber connect into another 8-inch pipe, these two connecting with a 10-inch pipe and running over to a 14-inch pipe which connects with the ventilating device shown in Fig. 4. The smoke pipe from this ventilating device and the furnace is 12 inches in diameter and connects with a 12 x 12 flue, a flue of this size having been provided in order to operate the furnace properly and to carry away the air returning from the ventilating system.

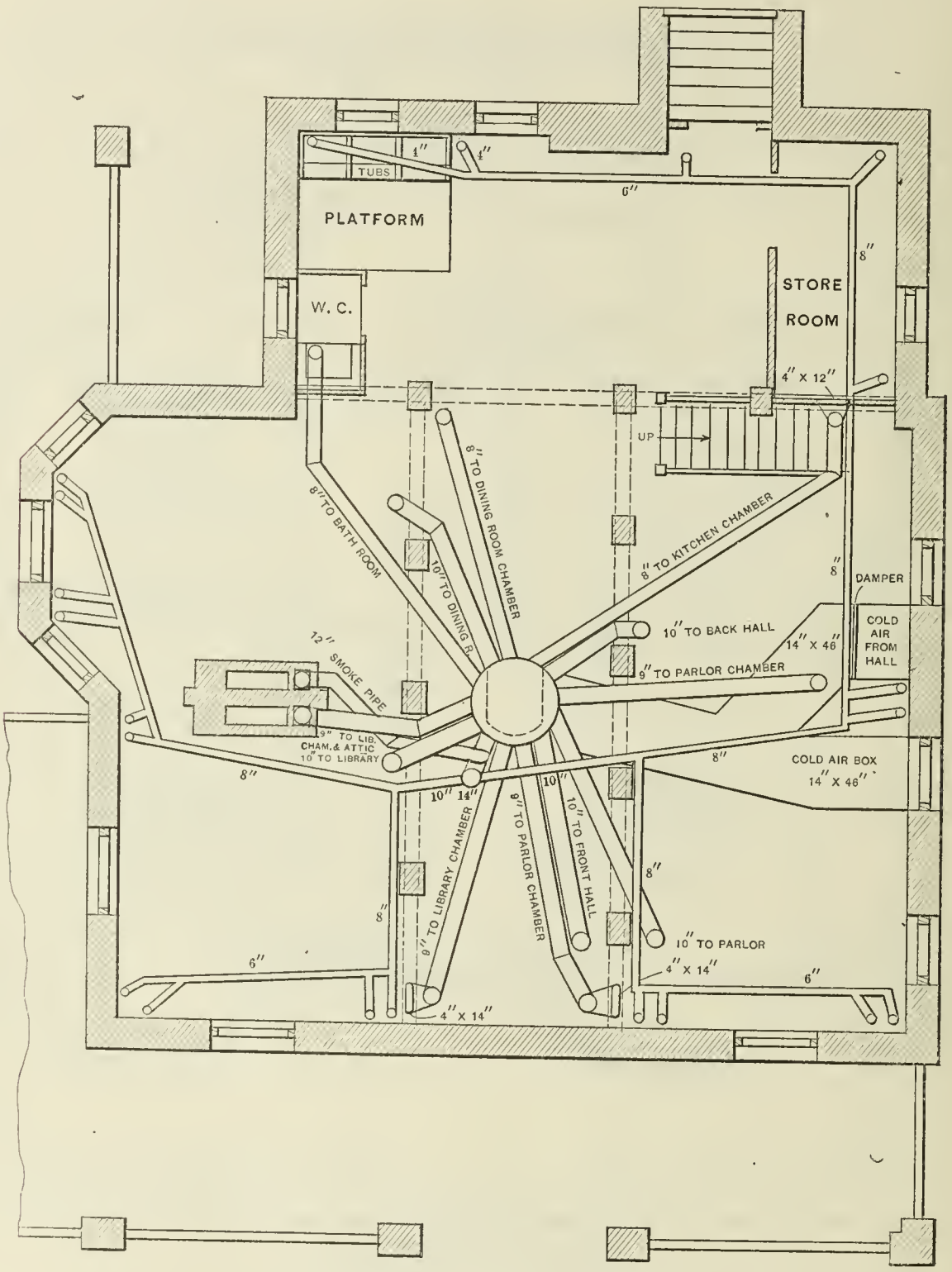


Fig 3.—Basement Plan, Showing Piping System.

The sizes of the various hot air pipes are marked on the basement plan. The basement plan also shows where the 4-inch exhaust pipes from the various rooms come down on the outer walls and connect with the larger pipe which skirts the basement wall to receive them. Commencing at the back of the house a 6-inch pipe receives two vent connections and passing to the north side receives two more, when it is increased to an 8-inch pipe and runs toward the front of the house, where it receives two more, and then runs toward the furnace. The exhaust from the parlor and the parlor chamber are connected into an 8-inch pipe, which runs over to and connects with the same 10-inch pipe which receives the pipe from the back and north side of the building. The vents from the din-

The floor plans give the dimensions of the different rooms, the space heated and the area of the hot air pipe used for heating the room. The ratio of 1 square inch in the hot air pipe to these different quantities is also given. In the rooms that are ventilated the vent pipe area is given and the ratios of 1 square inch in the ventilating pipes to the space in the room. This will enable the student of heating to get a more correct idea of the relation which various parts of the system bear to each other. In calculating the equivalent glass surface, it is assumed that an expanse of 10 square feet of wall surface has the same cooling effect as 1 square foot of glass surface. The custom of making hot air pipes of standard sizes and not varying them according to a room to provide an area in

proportion to the size of the room prevents the relation between the hot air pipe and the equivalent glass surface being the same in all cases. It will be noticed that a given amount of equivalent glass surface is designed to be heated by a given amount of hot air in the first floor rooms, and that an increase of surface is carried by the same amount of hot air pipe area when the rooms are on the second floor. Those who are looking for a rule for determining the sizes of hot air pipes required for rooms will find it much safer to reduce the wall surface of the room to equivalent glass surface than to follow some of the rules of cubic feet of space that have formerly been used.

Under ordinary conditions, in a majority of cases, 1 to 1½ square inches of area in hot air pipe will take care of 1 square foot of equivalent glass surface in the room to be heated when the room is on the first floor. When the room to be heated is on the second floor 1 square inch of hot air pipe area should be provided to heat rooms for each 1 to 1½ square feet of equivalent glass surface. Owing to the fact that two registers are placed in both

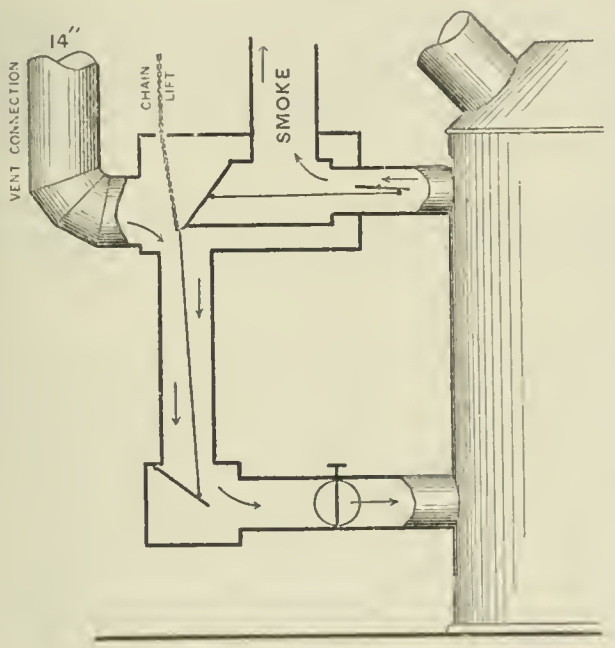


Fig. 4.—The Exhaust Ventilation Connection.

the library chamber and parlor chamber a large amount of hot air pipe area is provided in connection with these two rooms, and the proportions of this part of the heating system seem to be larger than necessary when compared with the rooms immediately beneath them, but as the system has been in satisfactory operation it may be assumed that the provision is made owing to the fact that these rooms will be frequently used as sitting rooms. From the plans it will be seen that the vent area is about one-half of the hot air pipe area, but when it is taken into consideration that the hot air enters at one temperature and shrinks considerably in bulk before finding an outlet through the vent pipes it will be readily seen that the carrying capacity of the two pipes is more nearly even than the areas would represent.

The furnace used has a grate 26 inches in diameter and a grate area of about 530 square inches, or 3⅔ square feet. In the space immediately heated the total wall surface is about 2377 feet, although the cooling effect of a larger space of wall surface has an influence on the heating capacity of the furnace. The equivalent glass surface is 763 square feet, and it may be said here that this does not give the full amount of cooling influence with which the furnace must contend. The cubic feet of space immediately heated is 28,043 feet. The proportion which the hot air pipe bears to the total contents is 1 square inch to 44 cubic feet and 1 square inch to 37 square feet of wall surface and 1 square inch to 1 2-10 square feet of equivalent glass surface. The proportion of grate surface is 1 square inch to 53 cubic feet of space and 1 square inch to 4 4-10 square feet of wall surface and 1 square inch to 1 4-10 square feet of equivalent glass surface.

Those who have made a specialty of heating with hot air furnaces lay out their work with much less labor than is required to supply the information given about this heating system, and in the main are successful in their work. They will be interested, however, in looking over the plans presented and the data given in connection with them, and will doubtless be glad to learn that there does exist a very close relation between the cooling surface in the building and the heating systems which they design and install that can be presented in figures that would not vary greatly if compared.

Monarch Stove Company's Eastern Branch.

Emmett C. Baxter, general manager of the Monarch Stove Company, Mansfield, Ohio, has been spending the present week in New York as the guest of A. L. Canfield, 284 Pearl street. While here Mr. Baxter completed arrangements to open an Eastern branch house at 284-286 Pearl street, New York. A. L. Canfield will be the manager of this Eastern branch of the Monarch Stove Company and look after the interests of the Monarch line of gasoline, gas and oil goods in New York State, Eastern New Jersey, Connecticut, Vermont, New Hampshire and Maine. A suitable warehouse has been arranged for, where a large stock of gas, gasoline and oil goods will be kept to supply the wants of the trade in above locality. The Monarch people will add a number of new and strong features to their line this season, which they will shortly present to the trade.

ODD PLATES.

At a recent meeting of the Board of Directors of the Warren Hardware Company it was decided to enlarge the capacity of the Warren Steel Range Works, Warren, Ohio, the product of which is handled by that concern. The principal building will be raised and a basement constructed which will give an additional floor space of 5200 square feet. This improvement will also necessitate a larger working force. We understand that the company's business has grown to such an extent that the enlargement of the works can no longer be deferred.

The Henry N. Clarke Company, Boston, Mass., dealers in Stoves, Ranges, Heaters and Stove Repairs, long established at 105 Blackstone street, have leased property on Union street, where they expect to be located shortly after January 1.

The demand for a Range suitable for small families which would operate satisfactorily and economically, and at the same time not throw off too much heat, has prompted the Leaf Stove Company of Lansdale, Pa., to bring out an attractive five and six hole construction which they are offering under the name Elm Leaf, and which is illustrated and described in a little circular just issued. The Range is neat in its ornamentation, and is made in three sizes and eight styles, having 6, 7 and 8 inch covers, the arrangement of which is shown by outline drawings.

The Girard Stove & Foundry Company, Youngstown, Ohio, are directing attention of the trade to the different sizes of their Adelbert Prize Wood Cook Stoves. Their announcement states that they have a large stock of these Stoves on hand which they are desirous of closing out before January 1, 1898, and to accomplish this they are naming very low prices on these goods. Full information will be furnished by the firm on request.

Prodigal of heat, parsimonious of coal—is a phrase applied to the Paragon Furnace by Isaac A. Sheppard & Co., Philadelphia. It refers to the equalized draft which they say not only makes the coal burn evenly, but gets out of it the greatest amount of heat possible.

The Cleveland Stove Works of Cleveland, Tenn., have just brought out a new high grade four-hole cook, which they are offering under the name The Chief. It is of attractive exterior, has grate and ash pit so arranged that a clean, clear draft is said to be always assured, has heavy ring covers, supported center, tin lined oven doors, patent oven door opener, a heavy grate and a large, high oven. It is made in three sizes with ovens 18 x 18 and 20 x 20 inches. The manufacturers refer to The Chief as a very durable Stove as well as a rapid baker, having large flues and good draft.

The Bridgeport Stove Company of Louisville, Ky., have been incorporated, with a capital of $75,000, by C. W. Adams and others.

The Bellaire Stove Company, Bellaire, Ohio, manufacturers of Star Ranges, cooking and heating Stoves, expect to double their capacity in 1898, and will have some of the latest novelties in the Stove line. This concern regard the

prospects for next year as very bright and confidently expect to do a very large trade.

The Indianapolis Stove Company, Indianapolis, Ind., are running their works full capacity, and are said to be employing more men than at any time in their history. The new foundry building is 318 x 72 feet, and is equipped with every modern appliance necessary to the successful operation of an extensive Stove manufactory. It is intimated that in the future a portion of the buildings formerly occupied by the Indianapolis Cabinet Works will be used for warehouse purposes.

The T. A. Snow Company of Chattanooga, Tenn., have distributed a folder of somewhat liberal proportions illustrating the Southern Queen Sheet Steel Range, which is offered in a number of styles. This Stove has four and six boiler holes in the top surface, is provided with the modern improvements and is adapted for burning wood or coal as a fuel. Reference is also made to the Southern Queen Sheet Steel Laundry Stove, as well as to the company's No. 308 Range of a size adapted for use in restaurants and hotels. A list of vessels going with each Range when ordered is presented, also some suggestions to be followed when ordering Ranges.

Hugh R. Chambers, representing the Phillips & Clark Stove Company of Geneva and Troy, N. Y., has recently been making a tour, calling upon the trade in various parts of the State. The week before last he was in Fort Plain, where Stewart, Shults & Bergen handle the Andes Stoves and Ranges.

W. H. Colebrook & Co. of Syracuse, N. Y., call the attention of the trade to the merits of their asbestos furnace cement by means of a large card, which is designated as "Style A, Business Men's Mailing Card." It is in effect an exaggerated postal card, on the back of which is printed some information relative to Crown Asbestos Furnace Cement and the claims which are made for it by the manufacturers.

The Ringen Stove Company, St. Louis, advise us that their Steel Range department is running full, and that orders are coming in for Quick Meal Steel Ranges in a very satisfactory manner. Their sales for the season of 1897 to December 1 are just double what they were for the corresponding period of last year.

The Howard Stove Company of Beaver Falls, Pa., favor us with a very neat catalogue bound in red paper covers of their leading specialties. The important addition to their already extensive line is the Domestic six-hole Range, made in a variety of styles and sizes, and embellished with ornamental features which cannot fail to catch the eye of both dealer and consumer. Its constructive features are modern in every particular, and the manufacturers state that the Range is the best seller they have ever offered to the trade. It is intended for hard or soft coal or wood, and is made both right and left hand. It has an oven 20 x 20 x 13 inches, and the size of top measures 29 x 46 inches, these dimensions including the back shelf. Other goods shown in the catalogue include the Cook's Pride, a four-hole left hand Range; the America, a six-hole Range, made either right or left hand; the New Howard; the Hero, a four-hole cook; the New Nora, the New Woman's Rights, for wood only, and the Banner. Various styles of Heaters are also shown, including the Howard Franklin, the Howard Oak, the Ohio Cannon and the Cantaloupe Box.

Among the Special Advertisements this week is one from Schmidt & Co., 114 Nassau street, New York, relating to a down draft, fuel saving, smokeless Stove, especially adapted for burning all sorts of soft coal, about which they wish to correspond with Stove manufacturers.

John Depinet and John G. Liebel, proprietors of the Chicago & Erie Stove Works of West Twelfth street, Erie, Pa., announce under date of December 12 that they have purchased all the business of the Chicago & Erie Stove Works, and will soon start the plant for the purpose of manufacturing the well-known line of Invincible and Helper Stoves and Ranges. Mr. Liebel was for many years connected with the South Erie Iron Works and is thoroughly familiar, by reason of his practical experience, with the manufacture of Stoves.

The Evansville Stove Works of Evansville, Ind., are offering their Model Queen Four-Hole Cook Stove for coal or wood in two sizes, the ovens measuring 18 x 22 x 12½ inches. It is embellished with cast ornamentation of attractive design, augmented with nickel plating on the oven doors, nickeled oven shelf, name plate and oven door opener. A circular which the company have issued also shows the Model Pearl Four-Hole Wood Cook, which is offered in three sizes.

The American Tubing & Webbing Company of Providence, R. I., have recently erected a brick factory 250 feet in length by 57 feet in width, equipped with special facilities to make Gas Stove Tubing. They state that since occupying their new building they have increased their facilities some 50 per cent. and look forward to a prosperous year. Their Flexible Tubing with ½-inch Caldwell's patent ends has proven very popular and is highly spoken of by the large manufacturers of gas stoves. The price-list which the company have recently issued shows the various styles of Tubing which they manufacture.

The Peninsular Stove Company, Detroit, Mich., have issued a very attractive little folder calling attention to the merits of the Modern Peninsular, Sovereign Peninsular and Family Peninsular Cook Stoves, which are adapted for burning coal or wood. In connection with the Modern Peninsular, the manufacturers refer to the merits of the steel oven and state that there is a big saving in both time and fuel and that it bakes quickly and economically. In connection with the Sovereign Peninsular, it is stated that it is "constructed on the latest practical and scientific principles for the combustion of soft coal." It is described as an even baker, a rapid cooker and decidedly economical. The Family Peninsular is designated as an up-to-date Cook Stove in which "every advanced idea in construction, style and finish is embodied." The folder carries a *fac-simile* of the Peninsular guarantee bond which accompanies every Peninsular Stove, Range and Furnace.

The Excelsior Stove & Repair Mfg. Company, Quincy, Ill., are sending out a circular letter informing the trade that they are now in a position to fill all orders promptly on their line of Sheet Iron Air Tight Wood Heating Stoves and Up and Down Draft Radiators. The company inform us that they have operated their plant day and night since August 1, and report a largely increased business.

The Cook & Van Evera Company, 173 Lake street, Chicago, are advising the trade by means of facetious cards that they are in line for the season of 1898 with Jersey Cooks and Ranges and the Wickless Blue Flame Oil Stove.

The March-Brownback Stove Company of Pottstown, Pa., are distributing with their compliments a very neatly gotten up memorandum book of a size convenient to carry in the vest pocket. It contains a calendar for the years 1898-99, blank lines on two pages to be filled in for purposes of personal identification, a few suggestions as to what to do in case of accidents, some antidotes for poisons, Weather Bureau signals and their explanations, rates of postage, &c., and a number of pages for noting the expiration of insurance policies. A majority of the pages are spaced with lines (a week to a page) for purposes of memoranda. The little pamphlet is of the same general style as those which constitute convenient advertising mediums and are widely distributed at the close of each year.

Apostolides & Co., Braila, Roumania, who are large importers of American Machinery, announce their intention next year of adding all kinds of American Hardware Novelties, Bicycles, Typewriters, Sewing Machines, Tools, Lamps, Stoves, &c., to their line, and also opening up a general commission department. For this purpose their superintendent, James E. Erckman, is now on his way to New York City, where he will make his headquarters at 631 Second avenue. They request American manufacturers of the above goods to send catalogues, prices, &c., in duplicate to Mr. Erckman in New York City and to the house in Braila.

Boulard & Co., who are opening a new Hardware store at 274 St. Lawrence street, Montreal, Quebec, would be pleased to receive catalogues and other printed matter from manufacturers of Hardware, House Furnishing Goods, Mechanics' Tools, &c.

The trade are reminded of the products of the Meriden Machine Tool Company, Meriden, Conn., by a number of very clever and entertaining little circulars which they distribute. From the outside of the pamphlets there is no telling what is within, and the reader's curiosity is worked up through some little distance before he is satisfied by being brought up face to face with the extensive assortment of forming lathes made by this concern. Any one who is curious to examine these publications will do well to write to the Meriden Machine Tool Company for samples.

We are officially advised that the articles recently published in the Pittsburgh daily papers concerning location and building of a large Steel plant by the W. Dewees Wood Company are erroneous, misleading, damaging, and altogether without foundation.

The Massillon Bridge Company, Massillon, Ohio, have closed a contract for building a steel cantilever bridge, 800 feet long, over the Magdalena River, at Honda, South America.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Only business of strictly commonplace character has taken place the past week, and wholesale prices have fluctuated to no greater extent than 5c. per 100 lbs. No life has been infused into the once speculative branch of the market, and it seems doubtful that consumers or jobbers purchased more extensively than almost certain near future and immediate wants necessitated. The arrivals since December 1 have exceeded 1100 tons, but this large supply has caused no pressure to sell, and it is therefore presumed that consumption is remarkably good for this season of the year, despite the calm state of the market. Jobbers continue to quote 14¾c. per lb. for small lots of Straits Pig from store.

Copper.—The improvement in values and the better tone to the market that were noted last week have made no further progress, but no reaction has taken place, although reports of other than ordinary transactions were strictly the exception. More than passing attention is given to the fact that the exports thus far this month have exceeded 5000 tons, and to the probability that, with necessary ocean freight room, the total for the entire month will reach 10,000 tons, in the face of somewhat long continued reports of trade being slow. Consumption is good for the season of the year and retailers' prices are firm, small lots of Lake Ingot from store ruling at 12¼c. and of Ansonia Grade Casting Copper at 11¼c. per lb.

Sheet Copper.—The condition of this material has in no wise varied during the past week from that mentioned in our last report. The demand is tame and confined to small lots for immediate delivery. Competition among dealers is rather keen, and prices, in a retail way, are hardly as strong for Sheet Copper as for the raw material. It is nominally quoted at 15c. per lb., basis.

Pig Lead.—Dealings have been on a moderate scale, consumers restricting their purchases to the limit of their immediate needs, while the big buyers seem to be out of the market. There is a fairly large volume of inquiry, however, and the market at the close showed somewhat better tone. Jobbers quote American Pig in small parcels from store at 4⅛c. to 4¼c. per lb.

St. Louis advices report that the market for Pig Lead in that quarter shows considerable firmness. Offerings are fewer and producers are not disposed to accept future business except at advanced prices.

Spelter.—Offerings have continued free and the market remains in a somewhat unsettled condition, under the weight of present and prospective over supply. There has been merely a moderate business, the demand being very slack at present. Jobbers' prices are rather easier, good Western brands in small lots from store ruling at 4 45c. to 4½c. per lb.

St. Louis advices indicate no change in this metal in that quarter. Offerings are free, but buyers are few and cannot be induced to anticipate their wants.

Sheet Zinc.—A moderate demand exists of very ordinary type. Prices are unchanged. Jobbers quote 600-lb. cask lots at 5⅝c. to 5¾c. per lb, and smaller quantities at 6⅛c. to 6¼c.

Antimony.—An ordinary movement in a jobbing way is about all that has taken place. Prices for retail parcels are steady at about 7¼c. to 7½c. per lb. for Japanese, 7¾c. for Hallett's and 8½c. for Cookson's.

Nickel.—Prices remain steady at about 37c. to 38c. per lb. for small quantities.

Aluminum.—The demand for this metal keeps up in good volume. Present prices are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c, and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100-lb. lots, 30c.

Tin Plate.—There has been some improvement in the tone of the market as compared with a week ago. Early in the current week business of very fair volume was effected in American Cokes, chiefly for delivery during the first three or four months of the coming year. Toward the end of the week, however, the market relapsed into comparative dullness. Prices closed quite steady, ruling 5c. to 10c. a box above the extreme lowest prices at which some business was effected some time ago, and there was no special pressure to sell for either spot or future delivery. The recent demand, which was only moderate, all told, was chiefly for 90 and 95 lb. Cokes. Charcoal Plates and Roofing Ternes were almost neglected. The outlook for business in the new year is regarded as doubtful. While many of the mills are well supplied with orders to last them some months ahead and available stocks of Tin Plate are quite light, yet prices do not maintain the strength which these features would suggest. An impression seems to be abroad among buyers that prices are likely to go much lower. Therefore they are holding off buying ahead in order to take advantage of the expected reduction. The premises for this belief are not very convincing, however, and most of those best able to judge do not at all share in the expectation of falling prices in the near future. On the contrary, they look for greater strength in the market for Tin Plate so soon as the large consumers begin placing their orders more freely. They think that for the present at least, or until the new mills now going up get into producing shape—which will not be till late in the year—the production will by no means exceed the consumption, but is more likely to fall behind it if the spring demand for Tin Plate assumes normal proportions. The retail business, as is usual at the close of the year, has shown a marked falling off during the week, only small lots for immediate use being called for. Jobbers' quotations are unchanged, moderate sized lots of American Plates for spot delivery at New York, Philadelphia or Baltimore being about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3 60; do., 100 lbs., $3 40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are moving in a very moderate way, outside of what is being done direct by packers of export goods. Prices are largely nominal.

Sheet Iron.—While the mills are still busy on orders placed some time back, the current demand for both Black and Galvanized Sheets has fallen off considerably and mill prices are hardly as firm as of late. Western mills are in some cases quoting for delivery in the East prices which underbid those generally maintained by the Eastern makers and some considerable cutting is also being done by the jobbers. Small lots from stock sell in this section at about 2.35c. to 2.40c. for No. 27 Common Black Sheets and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: This month will be one of the best Decembers in the Sheet trade for many years. The mills are full of work and more business keeps coming up. Prices are a little easier, probably on account of cut freight rates. Small lots from stock are quoted at 2.20c. to 2.25c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—Business is still very slow, both in home and export orders, and prices, while showing no quotable change, are inclined to weakness. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3¼c.
Zinc	per lb. 2¾c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10 50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5 25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	5.00

The December blotter distributed by the Joseph Dixon Crucible Company, Jersey City, N. J., shows St. Nicholas well laden with Dixon Pencils and about to descend a chimney. The statement is made that if the receiver does not find any Dixon Pencils in his stocking Christmas morning he should send 16 cents in stamps for samples.

CHICAGO REPORT.

Scrap.—The movement is light at present. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$6.75	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3 75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5 50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—No improvement has taken blace in the demand and concessions are still made. The card on carload lots of 12 tons minimum is now as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

Notwithstanding the proximity of the close of the year, and the fact that trade is feeling the quieting influences of the near approach of the holidays, business in general continues in at least fair volume. Jobbers generally, especially in the West, report a good demand, not only in seasonable specialties and holiday goods, but also for general Shelf and Heavy Hardware, indicating a good condition of things among the retail trade, who are apparently doing a better business than for several years. The large crops and the great amounts realized from them are thus evidently affecting the general situation and producing a more prosperous state of things than has existed for some time. The larger trade are purchasing conservatively and without much of a speculative spirit, but more confidently than for some years, and are anticipating a good business during the coming season. In the lines which may be affected by the consolidation of Wire interests now under consideration the market shows a firm tone, and such goods as Nails and Wire, which will be the first to respond in case the negotiations are successfully consummated, are held at slightly higher prices than prevailed a short time ago. In these lines, however, the manufacturers are refusing to accept orders for future delivery. In many lines the market shows but little change in the matter of prices. Shovels remain as before, the manufacturers not deeming it advisable to make the advance advocated by some. A revised list of Padlocks establishes slightly higher prices for these goods. Some lines are a shade weaker in price, owing to efforts on the part of manufacturers to induce orders by granting concessions to purchasers. On the whole the market is in a healthful condition and is characterized by a gratifying steadiness.

Advices from Chicago.—Shelf Hardware jobbers report a very active trade. The local jobbing interests now being centered in but two houses, it is natural to assume that they are profiting very much by the absorption of the business formerly done by those who have dropped out of the trade. The remaining jobbers, however, say that they observe that their regular trade is much heavier, and therefore attribute their large business to the improving general conditions. The demand, instead of calling mainly for seasonable goods, covers all classes of Hardware, including Builders' Hardware, Mechanics' Tools and Cutlery. The orders for Wire Products have been stimulated to some extent by the reported successful movement in the efforts to effect a consolidation of the manufacturers, and the improvement so far has not become sufficiently heavy to have a marked effect on the volume of trade. An excellent trade for December is reported in Tinware and House Furnishing Goods. The demand for seasonable goods in these lines has been strong, particularly for Elbows, on which dealers had not stocked up, and which are now badly needed. The Heavy Hardware trade shows no signs of falling off. The volume of business so far has been up to that for November, and it will be remarkable if December, as now expected, shows a heavier business than that month.

Advices from St. Louis.—The Hardware jobbing trade is gradually easing off, as is usually the case at this time of the year. Holiday goods are being ordered in large quantities and this department will show a heavy increase in comparison with former years. The general tone of the market shows underlying strength, and with a brisk trade after the turn of the year some advances in prices will doubtless take place. The numerous combinations talked of keep jobbers on the anxious bench, so that they find it difficult to determine whether it is time to place their orders or to await developments and order later. Collections are satisfactory.

NOTES ON PRICES.

Wire Nails.—During the past week the Wire Nail market has been characterized by a decidedly firmer tone, with a disposition on the part of manufacturers to refuse orders for execution after January 1. The trade evidently are endeavoring to cover their requirements in view of the possibility of higher prices, as a result of the successful accomplishment of the plans for the control of the Wire business. It has been difficult for the trade in many cases to place their orders on account of the depletion of manufacturers' stocks and the fact that the output for the remainder of the month has been covered. The price during the week has been held steadily at $1.40 for carload lots at mill. Small lots from store command the usual advance.

Advices from Chicago.—Manufacturers report heavy inquiries. Most of them are for deliveries extending into the future, on which they are absolutely refusing to quote. Orders are now being taken for immediate shipment only. The quantity of Nails available appears to be limited. Jobbers have advanced small lots from stock to $1.55, and this price may be pushed upward at any day.

Advices from St. Louis.—The market maintains the improved condition noted in our last report. The demand is extraordinarily large for this season of the year, and while the general impression is abroad that the proposed consolidation of the Wire interests does not necessarily mean higher prices for Wire Nails, retail dealers remember the last combination, and are not willing they shall be caught with light stocks and with an advancing market to face. Jobbers report a steady trade at $1.65 to $1.70, base, for small lots from store.

Cut Nails.—The Cut Nail market has been uneventful, there being only a moderate demand and a lack of strength in prices. Cut Nails have not as yet been affected by the firmer tone in Wire Nails. Small lots from store are held at $1.30 to $1.35.

Advices from Chicago.—Business in this line continues quite moderate, with small lots from stock unchanged at $1.45.

Advices from St. Louis.—There is no change to note in Cut Nails. The demand is only fair and prices are unchanged. Jobbers ask $1.45 to $1.50 for small lots from store.

Barb Wire.—The effect of the negotiations between the manufacturers of Wire Rods and Wire products generally is seen in the increased orders for Barb Wire which have been coming in to the manufacturers. The trade are evidently disposed to purchase somewhat conservatively, and yet to cover their requirements for next season at least partially, in view of the possibility of higher prices as the result of the success of the negotiations in progress.

Advices from Chicago.—Manufacturers are restricting sales of Barb Wire to orders for immediate shipment, except for the higher grades of Wire, on which the usual practices of the trade still obtain with regard to spring delivery. Ordinary Barb Wire is sold in restricted quantities, and prices are very firm at $1.60 for Painted and $1.90 for Galvanized in small lots from stock.

Advices from St. Louis.—The demand for Barb Wire

is only moderately heavy, yet mills are asking full prices and are not looking for business at cut rates. Jobbers quote Painted at $1.65 to $1.70, with the usual advance for Galvanized.

Smooth Wire.—The market for Smooth Wire is steady and has a confident tone.

Glass.—The factional strife between the cutters and flatteners on the one side and the blowers and gatherers on the other has been settled. This brings the settlement of the wage question between the manufacturers and workmen nearer, inasmuch as no agreement could be reached while the workmen disagreed among themselves. Trade features which have existed for some time continue. Manufacturers who hold Glass are demanding high prices. New York and Chicago jobbers are asking 60 per cent. discount. Imported Glass is quoted at 80 and 10 per cent.

White Lead.—The condition of the market and the general surroundings are much the same as they were a week ago. Crude materials have undergone only slight variation in price, orders for the pigment have been light, as usual at the end of the year, and no changes in corroders' lists have been made.

Red Lead.—Moderate sales of small lots from store make up nearly the entire business of the week, and little interest has been shown in contracts for future delivery. Prices, however, are held quite steadyall along the line.

Linseed Oil. — The market underwent no change until Tuesday, despite the fact that the cost of Seed has averaged higher. That purchases should be moderate is not a remarkable matter, since buyers usually go slow at the end of the year, but that buying should be as tardy as it is and competition so keen, in the face of the fact that Oil is relatively much lower than the raw material, is rather surprising. Seed is about 45 per cent. dearer than it was a year ago, while Oil is only 15 per cent. higher. Retail prices have been advanced to 42 to 42½ cents for City raw, with boiled 2 cents above those figures.

Spirits Turpentine.—The market has been quiet throughout the week, and prices have ruled steady at about 34 to 34½ cents per gallon for small lots from store.

Old Paper, Rags, &c.—Business keeps up well for the time of the year. The demand for almost all lines of Paper Stock is good and prices remain quite firm. Dealers are paying about the following rates for New York City delivery:

No. 1 White Rags	per lb.	2⅝ to 2¾c.
No. 2 White Rags	per lb.	1¾ to 1⅞c.
Mixed Rags	per lb.	1 c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1⅛c.
No. 2 White Book Shavings	per lb.	¾ to 1 c.
Light Book Shavings	per lb.	½ to ⅝c.
No. 1 Mixed Shavings	per lb.	⅝ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1 c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to 9/16c.
No. 1 Manila Paper	per lb.	⅝ to ¾c.
No. 2 Manila Paper	per lb.	⅜ to ½c.
Bogus Paper	per lb.	⅜c.
Common Paper	per lb.	¼ to 3/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	⅜ to ¾c.
Hemp Twine	per lb.	1⅝ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	¾ to ⅞c.

Old Rubber.—A fair demand is noted and prices show no quotable change. Local dealers are paying about the following figures:

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb	4 c.
White Syringes, per lb	4 c.

A bill presented to Congress by Secretary Long of the Navy Department provides for one sea going coast line battle ship for service on the Pacific Coast and six sea going torpedo boats and three torpedo boat destroyers. The battle ship is designed to carry the heaviest armor and ordnance, and to have a displacement of not less than 11,500 tons, with the highest practical speed. Her cost, exclusive of armament, is placed at $3,750,000. The torpedo boats are to be of about 175 tons displacement, to cost, including armament, not exceeding $1,125 000. The torpedo boat destroyers are to be of about 300 tons displacement, to have a speed of 30 knots, and to cost, including armament, not more than $900,000. The battle ship and not more than two of the torpedo boats and one of the destroyers are to be built on the Pacific Coast, and the remainder on the Atlantic Coast, the Navy Department being forbidden from placing contracts for more than two torpedo boats with any one firm.

The first Patton motor car ever built for street railroad purposes was successfully tested at Cedar Falls, Iowa, last week. In the Patton system the motive power is generated by gasoline, used to operate the dynamo which works the motors, the excess of power passing into a storage battery. This battery is intended to supplement the dynamo on heavy grades, or in starting with heavy loads, or, if necessary, may be used as the sole motive force for a distance of from 8 to 10 miles. The test, although performed under unfavorable conditions, is said to have been in every way satisfactory. The car was run a distance of 3½ miles in 21 minutes, the return trip being made in 17 minutes at a speed of 18 miles an hour.

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 16, 1897.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style,	
36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style,	
20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade,	
12 to 14 lbs. coating	9.00@ 10.00
STP / L Grade,	
10 to 12 lbs. coating	8.00@ 9.00
Dean Grade,	
8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.80¢ ₩ lb	2.50¢
17 to 20	1 90¢ ₩ lb	2.60¢
21 to 24	2.00¢ ₩ lb	2.70¢
25 and 26	2.10¢ ₩ lb	2.80¢
27	2.20¢ ₩ lb	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ₩ lb, A... $10.20 } 10%
Patent Planished, ₩ lb, B.... 9.20 } dis.
Craig's Polished Sheet Steel.....8¼¢
U.S. Polished Sheet Steel No. 27 A 5.45¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 luch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots ..... ₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
No 2 (guaranteed over 90% pure).
Small lots.....₩ lb, 34¢
100-lb lots .....₩ lb, 33¢
Nickel Aluminum Casting Metal.
Small lots.....₩ lb, 39¢
100-lb lots.....₩ lb, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....₩ lb, 35¢
100-lb lots .....₩ lb, 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....₩ lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....₩ lb, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 lb or more. Less quantities, 5¢ ₩ lb additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	₩ lb	₩ lb	₩ lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks..... 5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping ....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4¼¢
Bar.. .....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne .....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. .. ₩ square,	$4.75	$4.50
Galv..... ₩ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....₩ lb 2 ¢
" " Brown.....₩ lb 1½¢
" " Purple .....₩ lb 2½¢
" " Ground in oil, B. Red, ₩ lb 6½¢
" " Ground in oil, Red...₩ lb 6½¢
" " Ground in oil, Brown, ₩ lb 5½¢
" " Ground in oil, Purple, ₩ lb 6½¢
Linseed Oil, Boiled, in bbls.....37¢
Linseed Oil, Raw, in bbls.....35¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ₩ gal..... .34¢
Spirits Turpentine, in bbls., ₩ gal....35¢
Asphaltum, Trinidad Refined, ₩ ton.$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.25
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ₩ roll 108 sq. feet.....$1.25
Roofing Pitch, ₩ bbl. of 500 lb.....$3.00

NEW YORK, DECEMBER 17.

The following quotations are for small lots:

Aluminum—

No. 1 Alumiuum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than	6-in.	14-in.	24-in.
And including	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.42	.45
" 21 to 23	.42	.44	.47
" 24	.42	.46	.49
" 25	.43	.47	.50
" 26	.43	.50	.55
" 27	.44	.53	.58
" 28	.44	.53	.60
" 29	.45	.56	.65
" 30	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8¼@8¾¢
Hallett's.....₩ lb, 7¾@8¢
Japanese.....₩ lb, 7½¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in.	$0.35
5/8-in. up to ¾-in.	.36
½-in. up to 5/8-in.	.38
3/8-in. up to ½-in.	.41
5-16-in. up to 3/8-in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
1/8-in. up to 3-16-in.	1.50
Smaller than 1/8-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive.	.38

35% off.

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—
Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joiut.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2.00....	2.30¢
Nos. 17 to 21	₩ lb, 2.10....	2.40¢
Nos. 22 to 24	₩ lb, 2.20....	2.50¢
Nos. 25 and 26	₩ lb, 2.30....	2.60¢
No. 27	₩ lb, 2.40....	2.70¢
No. 28	₩ lb, 2.50....	2.80¢
American B. B.		₩ lb, 4¢

Russia, Planished, &c.
Genuine Russia, accord. lug to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

Nos. 10 to 10	₩ lb,	12¢
Nos. 17 to 21.	₩ lb,	13¢
Nos. 22 to 24	₩ lb,	14¢
Nos. 25 to 26	₩ lb,	15¢
No. 27	₩ lb,	16¢
No. 28	₩ lb,	17¢
No. 20	₩ lb,	19¢
No. 30	₩ lb,	21¢

75&10& 5% off.

36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½@4¾¢
Bar.....5¢
Pipe.....5¾¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....09½¢. 20%
Old Lead in exchnnge, 3½¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead. Amn. White, in oil.....5¾@0¢
Lead, Red bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1½¢
Red Venetian, Americnn..... @1¾¢
Linseed Oil:
Raw, ₩ gal..... .....42@42½¢
Boiled..... ....44@44½¢
Spirits Turpentine:
In bbls.....34@34½¢
In cases.....42@42½¢
Putty:
In barrels and ½ bbls..... ...1¾@2¢
In tubs.....1¾@2¢
In tin cans..... .....2½@3¢
In bladders .....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5 ¢
Clarified.....₩ lb 4¾¢
Accra.....₩ lb 4¾¢
Half Jnck.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil, ½c. ₩ lb higher.*)

Petroleum Products—

In Barrels (Barrel Iueluded).

Stove Gasoline..... ₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tlu.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings..... .....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertieal and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....05%

Plumbers' Brass Work—

List of December 7, 1890.

Ground Key Work, Rough.....70%
" " " Farnan's..65%
" " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....nct

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897..... 40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1806.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75&10%
Galvanized Iron Range Boilers above 52 gallon.....70&5%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....70%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....00%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized 50%

Miscellaneous.

Earthenware, List of Dec 5, 1893....60%
Drawn Lead Traps, List of Aug. 2, 1807.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

1897 List:
Japanned.....50%
Nickel Plated..... 40&10%
Solid Bronze..... 25%
Porcelain Enamel.....40%
Imitation Bronze.....40&10%
1896 List:
Japanned.....80%
Nickel Plated.....75&10%
Bronze Plate.....75%
Solid Bronze.....40%
Imitation Bronze.....75&10%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock. ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft.....1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.	₩ bbl.	$1.47@$1.48
Rosin, E. & F.	₩ bbl.	1.52@ 1.60
Rosin, G. & H.	₩ bbl.	1.65@ 1.70
Rosin, I. & K	₩ bbl.	1.80@ 1.90
Rosin, M. & N.	₩ bbl.	2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

Accordiug to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.	$3.75@$5.00
No. 1 Bangor Ribbon	3.35@ 3.75
Pen Argyle. ₩ sqr	3.75@ 4.35
Peach Bottom, ₩ sqr	4.75@ 5.60
No. 1 Chapman, ₩ sqr	3.80@ 4.80
Lehigh Slates, ₩ sqr	3.00@ 4.50

Vermont:

Sea Green, ₩ sqr	$2.50@$3.55
Purple, ₩ sqr	3.25@ 4.00
Unfading Green, ₩ sqr	3.75@ 4.50
Red, ₩ sqr	0.00@11.00

Solder and Soldering Fluids—

Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 09½@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....00¢
Concentrated Soldering Flux.
f o.b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb..... .....4¢
5 % dis.

Yager's Soldering Salts.
½ lb bottles, each.....80¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....15½¢@17½¢ net

Spelter—

Western Spelter.....$4.45@4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvnnized..... .....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15½¢
Straits, pigs, lb lb.....14¾¢
Straits, in bars, ₩ lb.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade, IC,		10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	10¢
95 lb	15
90 lb	20¢
85 lb	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating	$11.50 @ 18.00
Redipped, or Good Old Style, 20 to 30 lb coating	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating	8.00 @ 9.25
STP / L Grade, 10 to 12 lb coating	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 20..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Caland Grade,	IC,	14 x 20	$5.00
" "	IX,	14 x 20	6.00
Allaway Grade, IC,		14 x 20	4.25
" "	IX,	14 x 20	5.00

Coke Plates, Bright—

Steel Coke, IC,	14 x 20		$4.25
	IX,	14 x 20	5.25

Terne Plates—

MF, IC,	14 x 20		$6.25
	20 x 28		12.50
Worcester Grade, IC,	14 x 20		4.25
	20 x 28		8.50
Dean Grade, IC,	14 x 20		4.00
	20 x 28		8.00
Gilbertson's Old Method, IC,		14 x 20	7.50
		20 x 28	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain	72%
1¼ and less, Galv	67%
1½ and larger, Plain	78%
1½ and larger, Galv	70%
Screw and Socket Joint Casing	65%
Inserted Joint Casing	60%
Boiler Tubes, 2¼ inch and smaller	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son, Utica, N. Y.

Architectural Ornaments.
Frand, Martin J. & Co., Camden, N. J
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Willis Mfg. Co., Galesburg, Ill.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Blowers.
Cornell, J. B. & J. M., 26th St. and 11th Ave., N. Y.

Books.
Tower, F. W., Springfield, Mass.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Southner, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Poorman Mfg. Co., Piqua, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Crimping Machines.
Packham Crimper Co., Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs. Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.

Dampers.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Berger Mfg. Co., Canton, O.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Pease, J. F., Fice Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., New York.
Tuhular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Shepard, Sidney & Co., Buffalo, N. Y.

Galvanizing.
Gregory, Thos. Galvanizing Works. Brooklyn, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Whelan, Dennis, J., Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Magee Furnace Co., Boston, Mass.
Mitchell Heater Co., Poughkeepsie, N. Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fice Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
Kleckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

House Furnishing Supplies.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co., Boston, Mass.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Iron, Galvanized Sheet. (*See Sheets, Galvanized.*)

Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lard Cans.
Kleckhefer Bros. Co., Milwaukee, Wis.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Huse, Jos. & Son, Boston, Mass.
Munsell, Eugene & Co., 218 Water St., New York.

Nickel Plating Outfits.
Eddy Electric Mfg Co., Windsor, Conn.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

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Jenner, H. W. T., Washington, D. C.
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Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

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Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Fitter and Crimper.
Blumer, Doscher Mfg. Co., Brooklyn, N. Y.

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Dixon, Jos. Crucible Co., Jersey City, N. J.

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Johnson, E. J. & Co., 38 Park Row, N. Y.

Sap Spouts.
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Michigan College of Mines, Houghton, Mich.

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Crosby, G. A. & Co., Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.

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Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N.Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia Pa.

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Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
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Republic Iron Works, Pittsburgh, Pa.
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Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

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Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.
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Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Berger Bros., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y.

Stove Putty.
Connors, Wm., Troy, N. Y.

Stove Repairs.
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Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.
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Troy Nickel Works, Troy, N. Y.

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Stoves and Ranges.
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Eclipse Stove Co., Mansfield, O.
Girard Stove & Fdry. Co., Youngstown, Ohio.
Graff & Co., 208 Water St., N. Y.
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Michigan Stove Co., Chicago, Ill.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
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Stamford Foundry Co., Stamford, Ct.
Thatcher Furnace Co., 240 Water St., New York.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.
Clark, Geo. M. & Co., Chicago, Ill.
Reineke, Wilson & Co., Pittsburgh, Pa.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Clark, Geo. M. & Co., Chicago, Ill.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Tea Kettles.
Central Stamping Co., 23 to 25 Cliff St., New York.
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Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

Tea Pots.
Rochester Stamping Works, Rochester, N. Y.

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Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y.

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Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
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Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.
Sweeney, W. H. Mfg. Co., Brooklyn, N. Y.

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Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.
Keen & Hagerty Mfg. Co., Baltimore, Md.

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Marston, I. G. & Co., Boston, Mass.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co , 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct.

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Phelps, Dodge & Co., 11 Cliff St., N. Y.

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THE METAL WORKER.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A young man who has some knowledge of cornice cutting and drafting who wants to finish his trade in a good shop; state how long been at business and what wages wanted. "Cornice," office of *The Metal Worker*, 232-238 William stroet, New York City. Dec. 18

One first-class TINNER; one who can do all kinds of tin work, both inside and outside work; must be strictly sober, steady and reliable; will give the right man steady employment. M. J. Williams, 315 Main street, Baton Rouge, La. Dec 18.

SALESMAN New Engand States to sell stoves, ranges and furnaces; none except experiencod men who have traveled this territory and have some trade need apply; state experience, salary, age, &c. "N. E. S.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

Boy between 15 and 18 years of age to learn plumbing and gas fitting, with or without board; must be quick, honest and obliging; to the right boy all opportunities will be offered to learn the business, with other good prospects in future; give all particulars. "E. S.," office of *The Metal Worker*, 232-238 William street, Now York City. Dec. 18

TRAVELING SALESMAN familiar with Southern stove trade; must be young, sober and engeretic; state age, experience and references, also compensation desired. "Stoadfast," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

Would like to correspond with a good all around TINSMITH immediately; one who is used to all kinds of work done in a country shop and stove store and general jobbing; no floaters need apply. Tuckerton Tin & Sheet Iron Works, Tuckerton, N. J. Dec. 18

A first-class TINNER; one with experionce on coffee urn work; none other need apply. "E. L. B.," care Wrought Iron Range Company, St. Lonis, Mo. Dec. 18

SALESMAN for the West and South, acquainted with the iron and steel roofing business, tin plates, &c.; name territory where last employed and salary. "Roofing Salesman," office of *The Metal Worker*, 512 Commercial Building, St. Louis, Mo. Dec. 18

A TINNER and PLUMBER, good on inside and outside work; a sober, steady man; must be a hustler; steady work to right man. Weatherford, Thompson & Co., Chicago, Ohio. Dec. 18

A SUPERINTENDENT to take charge of the manufactnre of a line of tinners' tools in a well eqnipped machine shop making other goods; must be acqnainted with the patents on snch tools and machines and capable of dosigning them; good selling organization ready for the productions of a thoronghly capablo man; state age, experience and references. "Tinners' Tools," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

A man to do TINNING, PLUMBING and FURNACE WORK in a good town of about 3000 inhabitants. L. P. Smith, 69 Main street, Camden, N. Y. Dec. 11

A good experienced SALESMAN for Western New York territory, must have an acqnaintance among the trade in this section, by a Western stove fonndry; state age, experience, past employers and amount of yearly sales. "Western New York," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

Two first-class experienced STOVE SALESMEN to soll a leading trade-mark fino in Iowa. Address, with full particulars. "Leading," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

A first-class CUTTER, CORNICE and SKYLIGHT MAN; must be a good draftsman and thoroughly competent in every respect and ablo to figure accurately from architects' plans, and willing to take hold of anything that comes up, either inside or outside work. Timberlake & Nance, Huntsville, Ala. Dec. 11

SALESMAN travoling through northwest part of Indiana and western half of Michigan to handle a good line on commission; one visiting stove and hardware trade preferred. Box 243, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 11

At onco, a bright, onergetic man who can bustle in the jobbing, tinning and plumbing lines, as nsually found in a conntry shop, in Northern Pennsylvania; must be able to do work so it will stay done; work every day the year round and year by year if satisfactory; must have correct habits and como well recommended. "H.," No. 1211, office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

Jannary 1 a good TINSMITH; one who can repair bicycles preferred; no ono need apply without good references; a steady job for the right man in New England city of 20,000 inhabitants. "H. L. A.," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Dec. 11

A thoroughly competent SALESMAN for New England; one who has had experience and knows the trade. Address with references Rathbone, Sard & Co., Albany, N. Y. Dec. 11

By a tin plate and metal houso SALESMAN acqnainted with the trade in Middle and Western Now York State, Western Pennsylvania and Northeastern Ohio; also one acquainted with the trade in the States on the Atlantic seaboard; none but those thoronghly acqnainted need apply. "Metal," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

SITUATIONS WANTED.

An experienced SALESMAN, understands the steam and hot water heating, plumbing, stove and furnace bnsiness thoroughly, commands a good trado, wonld like to represent some reliable house. Henry Swartz, 2312 East Townsend street, Baltimore, Md. Dec. 18

As FOREMAN of a stove fonndry by one who has had 20 years' exporience, part of time interested; understands it thoroughly in all the branches, being a mixer and melter of iron; also a practical follow board and flask maker. "Foundry Foreman," office of *The Metal Worker*, 22-24 Pickery Building, Cincinnati, Ohio. Dec. 18

By a first-class CORNICE MAKER, all kinds of roofing; wonld like steady work; city or country. T. Diamond, 1029 North Fourth street, Philadelphia, Pa. Dec. 18

By an A1 SALESMAN witb some good honse; long experience in hardware, tin and stoves; can speak German and English. "German," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

By a young man who has had 12 years' experience at TIN and SHEET IRON WORK; good furnace worker; all kinds of inside and ontside work; best of references: wages moderate. Thomas Wheeler, Beaver street, West Orange, N. J. Dec. 18

As TRAVELING SALESMAN for tho coming year with a tin plate or motal house by a practical job tinner; a Christian man who neither smokes nor drinks. John E. Whitbeck, Box 408, Phelps, N. Y. Dec. 18

As FOREMAN in stove pattern shop; drafting, designing and carving; best of references. "H. X.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

By a japanner, plain and ornamental, as FOREMAN; understands all branches of the business; first-class references. M. T. Walkor, Floyds Knobs, Ind. Dec. 18

First-class PLUMBER, with nine years' practical experience, desires a steady position in any part of the United States; can furnish A1 reference. James P. Goodsell, 185 West Sixty-third street, New York City. Dec. 18

By a TIN and SHEET IRON WORKER and general jobber; city or country; accnstomed to gutters, leaders, heater and range work; eight years' experience; strictly sober; single man; can furnish good references if reqnired. Henry A. Wolfson, 73 East 106th street, New York City. Dec. 18

As SUPERINTENDENT of a foundry, by a man with 15 years' experience in the manufacture of stoves and rangos and steam and hot water boilers; a practical molder, with thorough knowledge of the business in detail; thoroughly familiar with modern enpola practice, and can furnish the best of references. "Foundry Superintendent," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

By first-class stove SALESMAN, with 15 years' road experience in Ohio, Pennsylvania, New York and Eastern States; established trade. "Trade," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

Practical TIN and SHEET IRON WORKER having over 20 years' experience in all its branches; has plumbing license for Brooklyn and New York City. "C. E. J.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

BOOKKEEPER or STENOGRAPHER; seven years' experience in manufacturing business; best of reference; bond if necessary. J. F. Copeland, Box 256, Cambridge, City, Ind. Dec. 18

By a first-class PLUMBER and GAS FITTER; a good hand on tin and sheet iron work. John Abrams, Hempstead, N. Y. Dec. 18

By a yonng man with 24 years' experinece in the shop, in the store and on the road, as TRAVELING SALESMAN in North and South Carolina, Georgia and Florida with a first-class stove mannfacturer, tinware and honse furnishing goods, or an importer of metals; well acqnainted with the trade in those States; best reference from present or former employers. "T. E. H.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

As an EXPERT on defective ranges and furnaces. "F. D.," office of *The Metal Worker*, 232-238 William street, New Yrok City. Dec. 11

A TRAVELING SALESMAN with established trade in Maino, New Hampshire and Vermont wonld like position witb some large concern not represented there in the kitchen furnishing line. "W. R.," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Dec. 11

By a first-class STOVE MOUNTER and FILER; experienced on repairs; references given. "Mounter," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

A steady position by a PLUMBER, GAS and STEAM FITTER; 30 years' experience in city and conntry; can take charge and estimato from plans; perfectly steady; references from past employers. "Industry," No. 1211, office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a good boy willing to work; can do tin and slate roofing, cornico and skylight work; can work from plans; references; wages $9 per week. John G. Wernor, care Mrs. Bellion Van Nest, Victor street, Westchester, NewYork. Dec. 11

By a STOVE PATTERN MAKER in a stove fonndry; understands making drawings, both mechanical and ornamental; good carver and designer, having had some 20 years' experience in that line. J. T. Tryon, 92 Roebling street, Brooklyn, N. Y. Dec. 11

By a young man who thoroughly nnderstands the completion of cornice and erection of steel ceilings. "H. D. T.," Canton, Ohio. Dec. 11

By a first-class STOVE PATTERN FITTER and FILER, also MOUNTER; 20 years' experience in stove foundries; have had charge of pattern and mounting shops; reference from present employers; moderate wages for steady job; 32 years of age; single, sober and industrions. "J. M. H.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a SOLDERER witb over ten years' experience; handy aronnd machinery; wages $6 a week. "Martin," care J. R. Brown, 72 Prince street, Brooklyn, N. Y. Dec. 11

By a first-class TINSMITH and ROOFER; 18 years' experience; married. B. Straus, 637 East Fifth street, New York City. Dec. 11

A line of cheap tinware on commission by a SALESMAN of experience whose territory is Eastern Colorado, Kansas and Nebraska. "Cheap," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a first-class TINNER; pump and all kinds of iron pipe work; wish to make a contract with a firm for a steady job; have a full set of pump and tin tools; 12 years' experience; 32 years of age; married. P. O. Box 39, Harrodsbnrg, Ky. Dec. 11

SALESMAN with an established trade with the hardware, stove and honse furnishing trade throngh the Southern States, is posted on all kinds of stove and tinware, is open for an engagement for the year 1898. "Sontbern," 519 Freemason street, Norfolk, Va. Dec 11

A SHEET IRON and TIN WORKER, first-class and experienced in every branch of the trade, including estimating, designing and cntting, would like a steady sitnation; is 50 years of ago; sobor and reliable; can act as salesman, &c., if necessary; non-union shops only; will accept position at employor's own fignre. Address till January 1, "Guarantee," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a young man 29 years of age, well experienced in the plumbing, steam and hardware business, best of references, as TRAVELING SALESMAN or inside man. "J. T. M.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By January 1, 1898, by a SALESMAN of 16 years' experience in stove, hardware and plumbers' supplies; ten years' experience traveling through Massachusetts and Connecticut; first-class references. "G. W. S.," 109 Milk street, Boston, Mass. Dec. 11

An experienced FOREMAN, DRAFTSMAN and ESTIMATOR desires to correspond with parties in the cornice and sheet metal trade in need of such a man; best of references as to ability and reliability furnished. A. C. Tietze, Girard avenue, Camden, N. J. Dec. 11

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Active, progressive American, 41, with 20 years' experience as a local and traveling salesman and sales agent of a corporation in this city, whose business is with stove manufacturers, jobbers and retailers of stoves, hardware, tin and plumbing goods; large acquaintance with buyers East of Chicago and Pittsburgh; thoroughly conversant with modern business methods, management of salesmen, &c., in every way capable of filling responsible position, is open for an engagement here or elsewhere, in which this experience can be utilized; clean record; high credentials. Address "A. B. C.," office of *The Metal Worker*, 232-238 William St., New York.

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Old established Tin and Sheet Iron Business, doing a good trade in Stoves, Ranges, Heaters, etc., also a 2½ story brick factory complete with tools and implements for the manufacturing of Tin and Sheet Iron specialties, to be sold entirely or in part, whichever is desirable. A good opportunity for a live business man.

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For Sale.

The Stock, Tools and Machinery of a sheet iron business. Also stock of Heaters, Ranges, and Household Goods in the store. This business is located on the principal business avenue of the city and is being sold on account of the death of the proprietor. For further particulars address or apply to
HENRY S. BEAVER, Manager of
William F. Beaver Estate,
13 West 3rd Street, Chester, Pa.

Special Notices.

Stove and Steel Range Manufactory
Located at MUNCIE, IND.,

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The stockholders of the JOSEPH BELL STOVE & RANGE COMPANY have passed an order to sell their plant and equipment and stocks of material and manufactured stock at public sale, on Wednesday, the 5th of January, 1898, on the grounds of the company at MUNCIE, IND.

The property consists of over 6 acres of ground conveniently situated at MUNCIE, IND., on the West Bank of White River, on the line of the Lake Erie & Western Railroad and accessible to the Big Four Road. The buildings thereon are nearly new and of substantial construction. The Molding building, of brick, is 135 by 145 feet. There are two cupolas. The Mounting and Storage building, also of brick, is two stories high, 260 by 60 feet. Office building and show room of frame, two stories. All of the best construction and conveniently arranged.

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The entire property, including all stock on hand at day of sale, materials, patterns, tools and equipment and good will, will be sold in one lot. Sale to take place on the grounds of the company, at MUNCIE, IND., on Wednesday, the 5th January, 1898.

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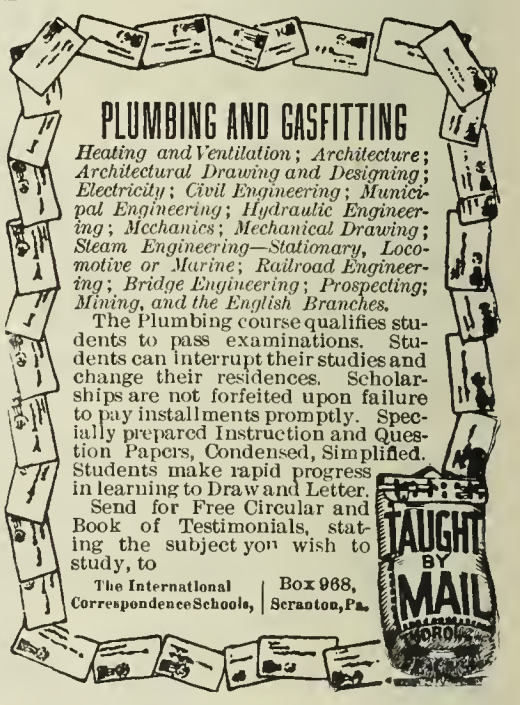
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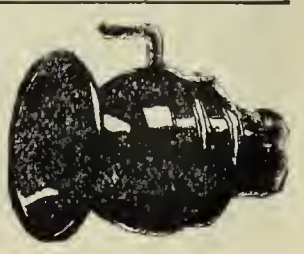

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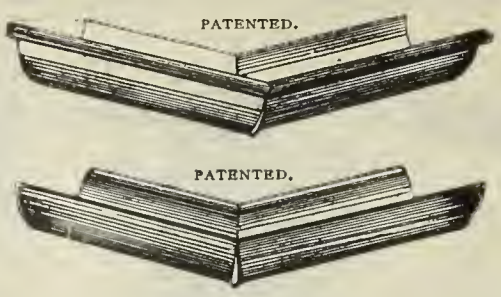

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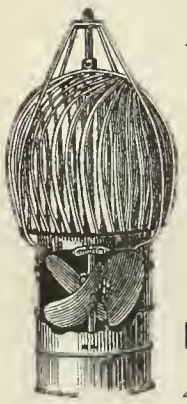

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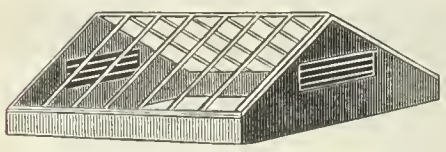

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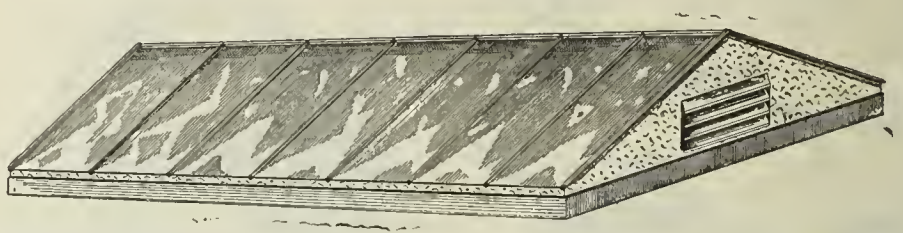

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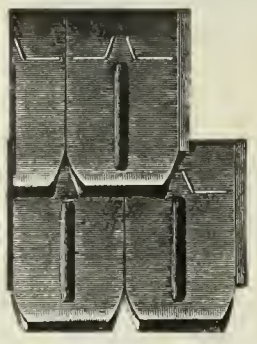

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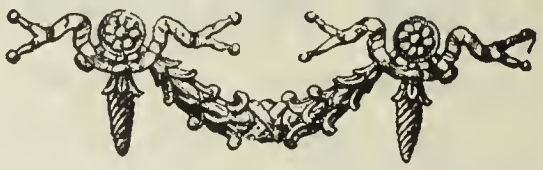

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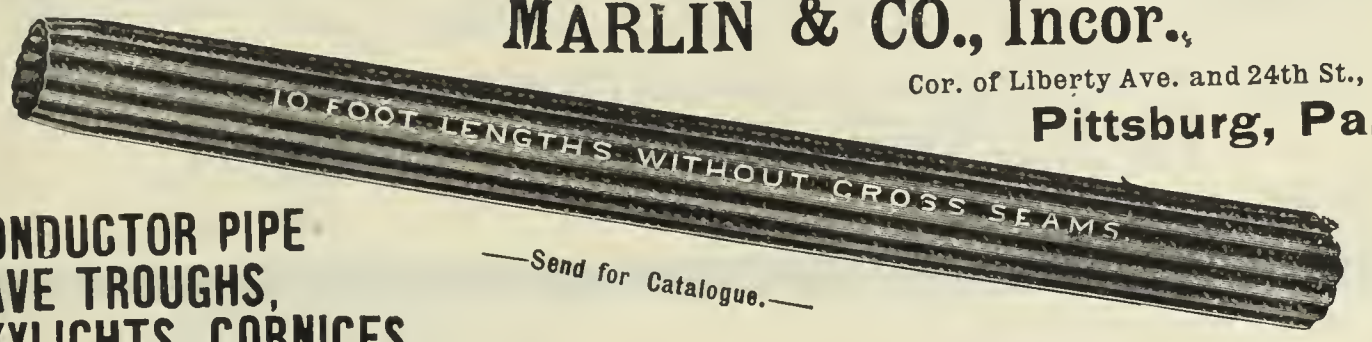

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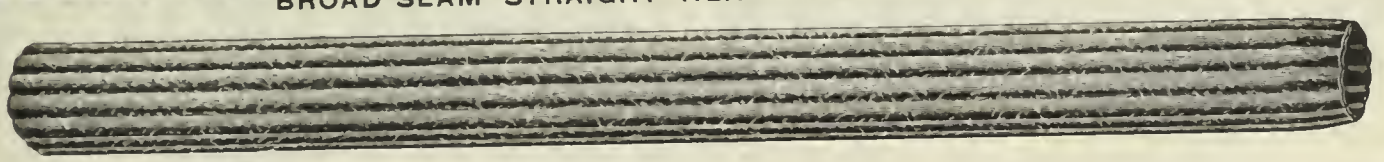

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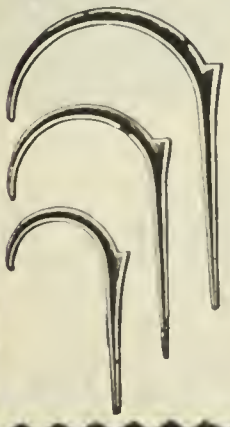

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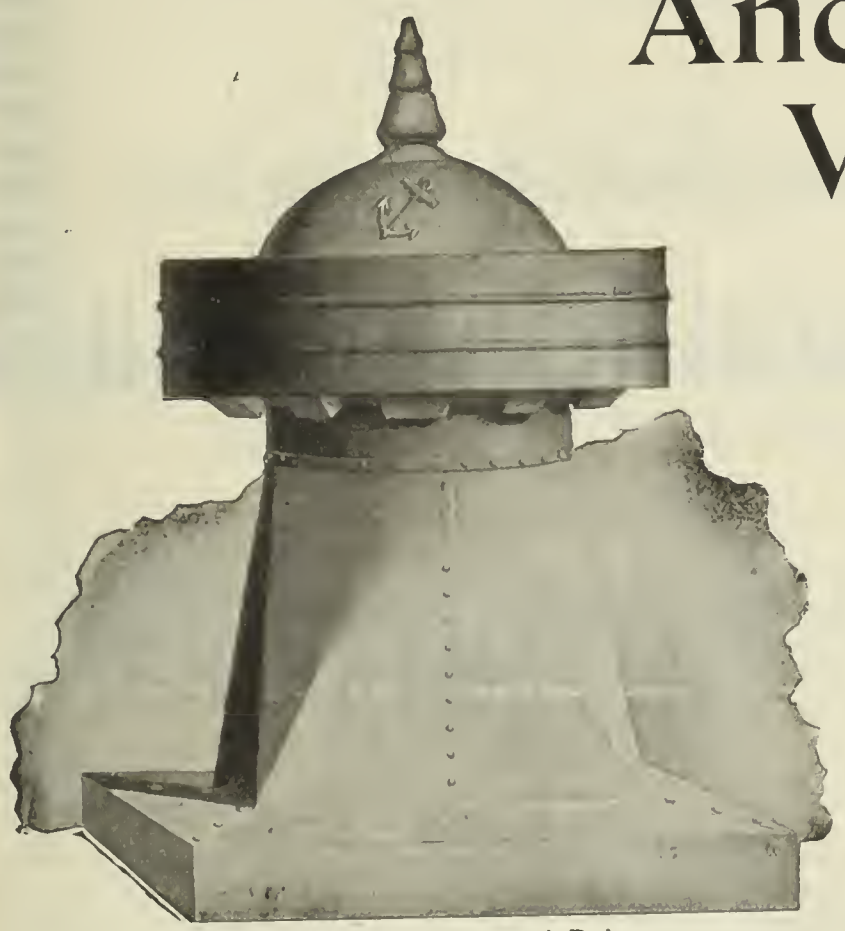

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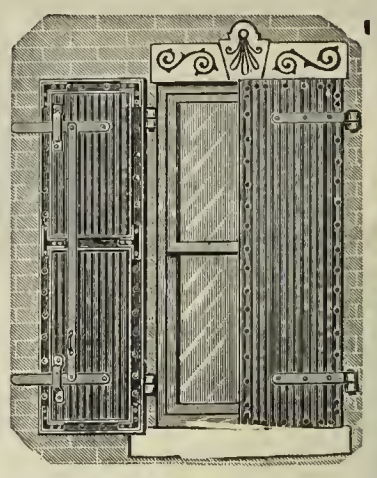

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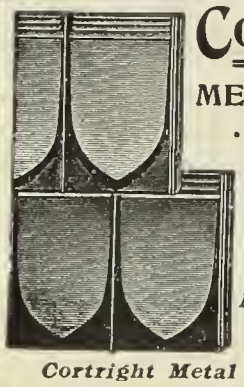

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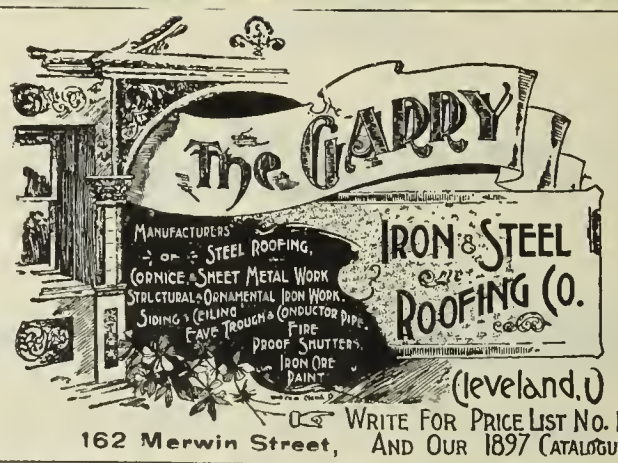

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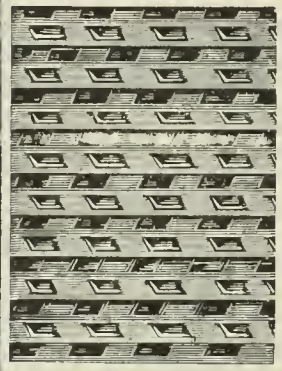

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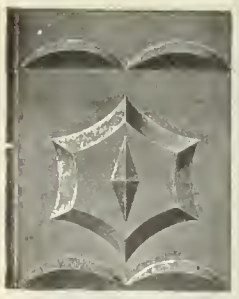

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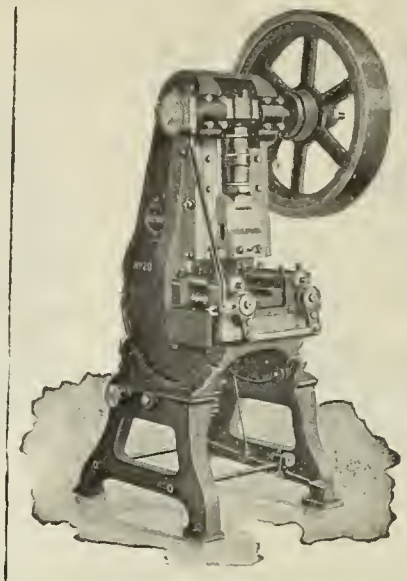

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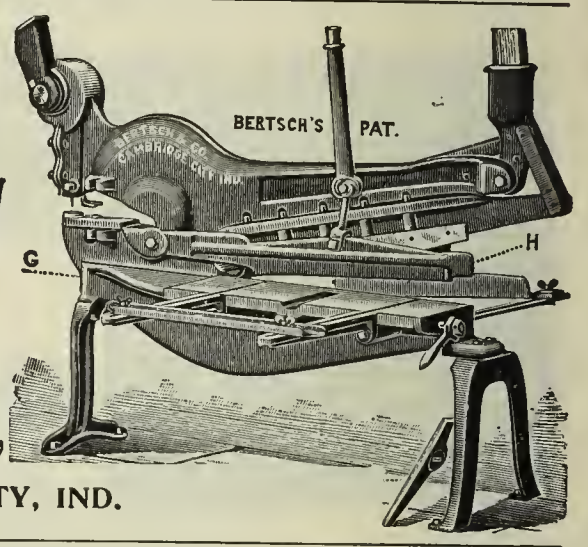

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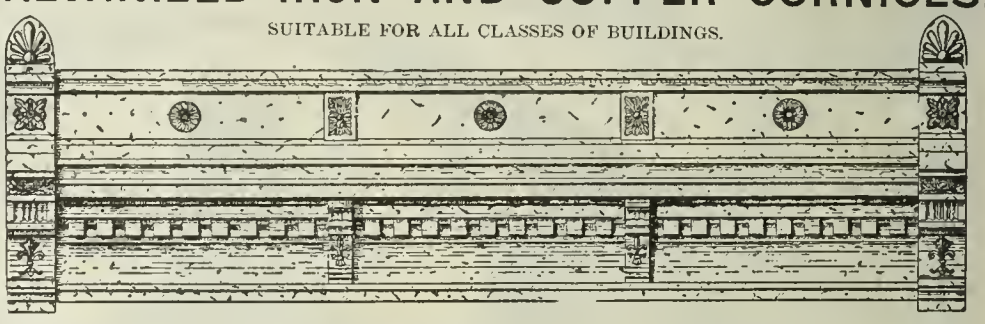

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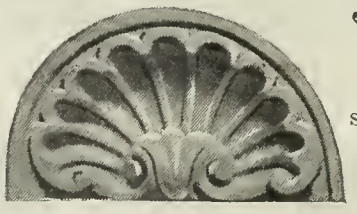

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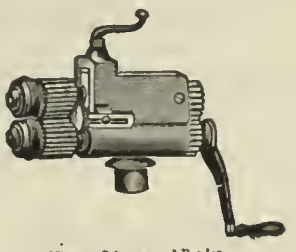

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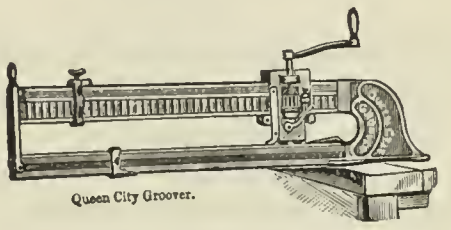

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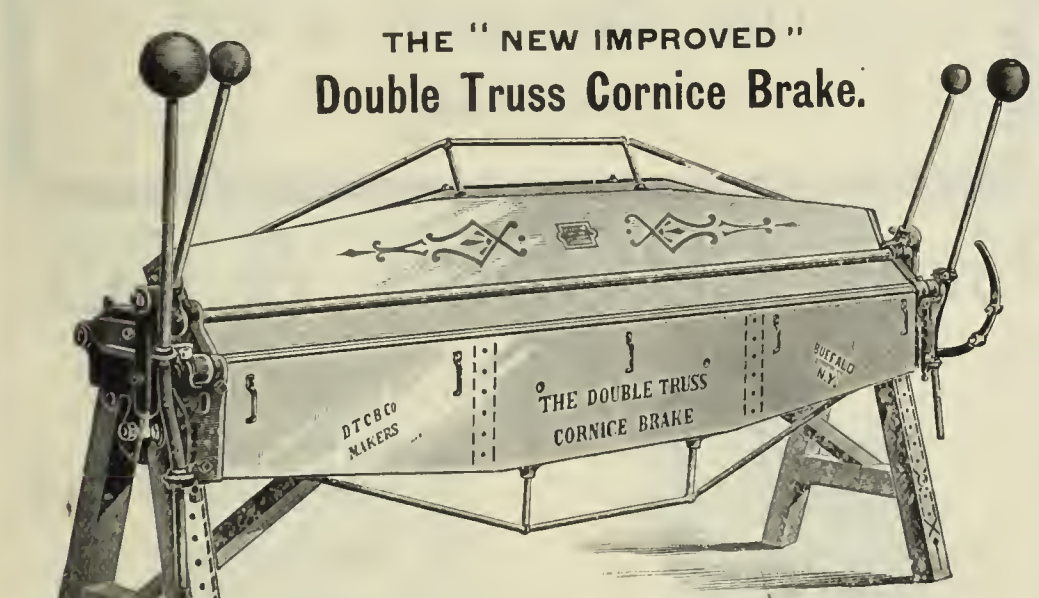

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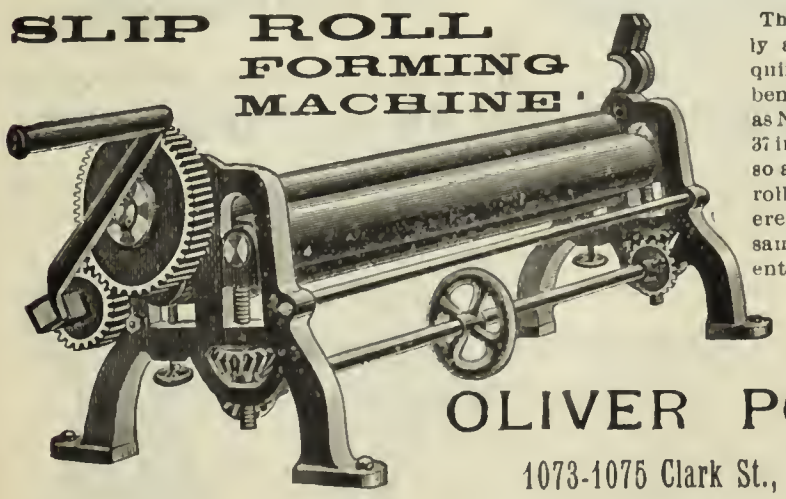

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On the following morning the unwooed bride-elect went to the young man and demanded an explanation. Thus cornered, he confessed the truth, adding: "If tha will not ha' me, I con gi' backword."

"Whod did tha pay?" asked the practical girl.

"Four an' sixpence."

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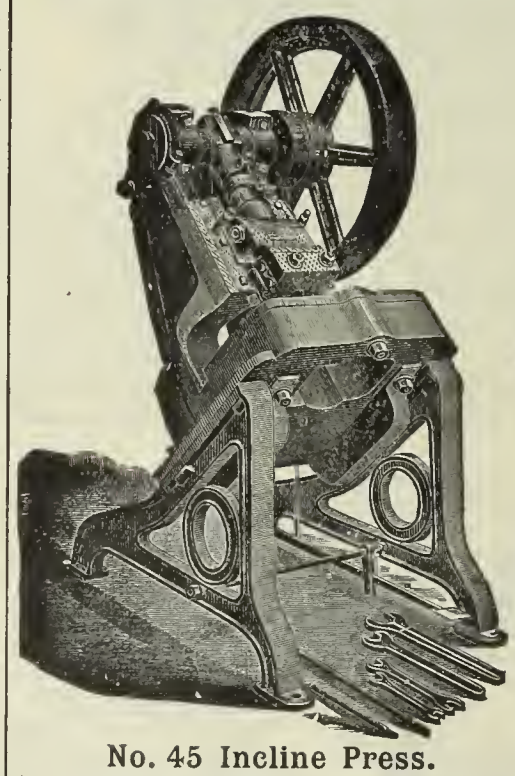

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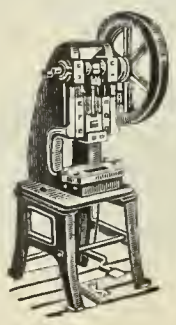

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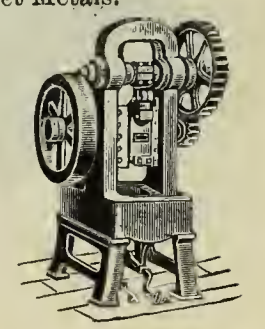

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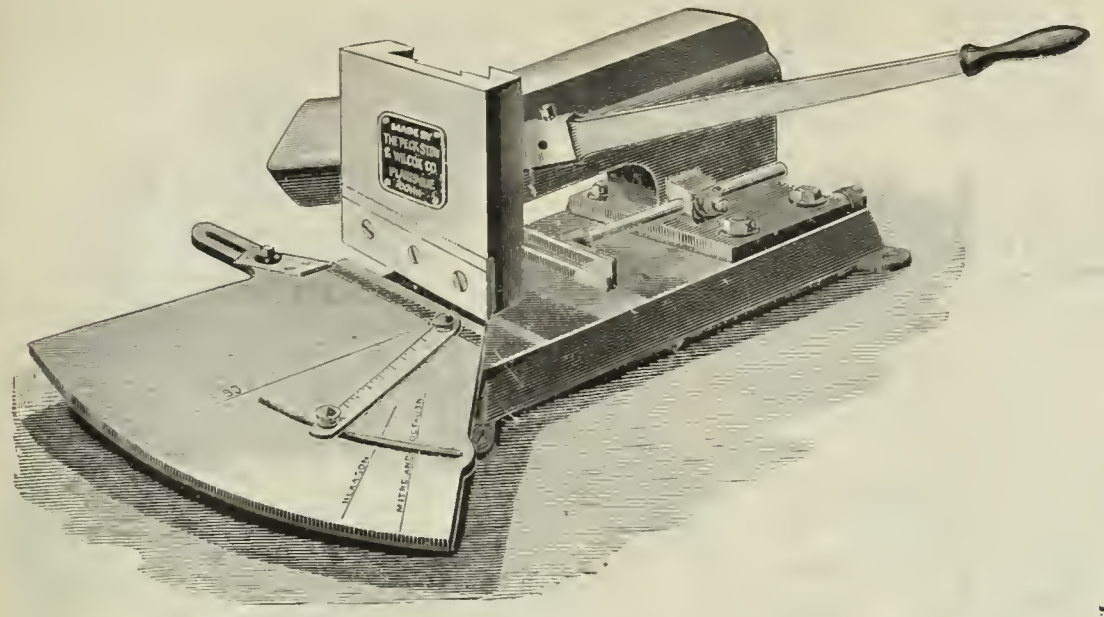

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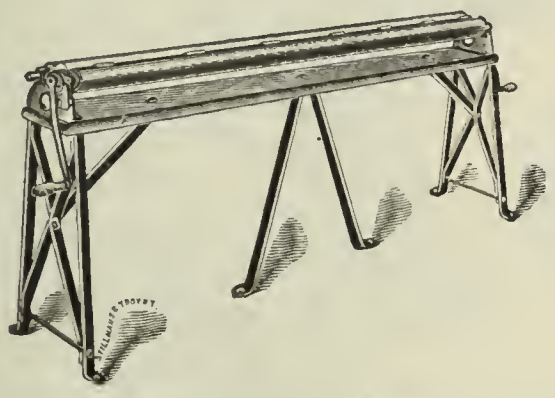

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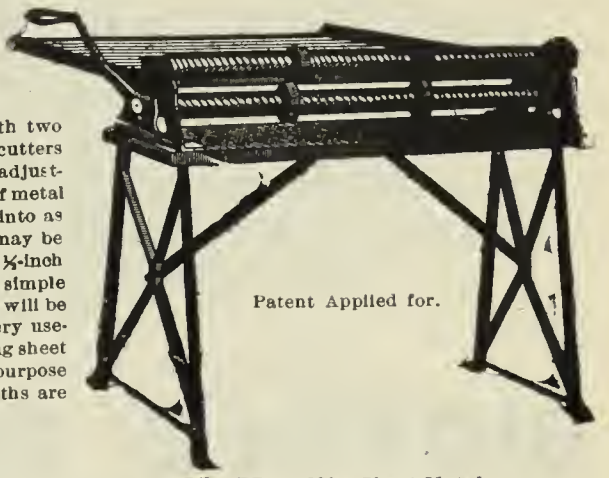

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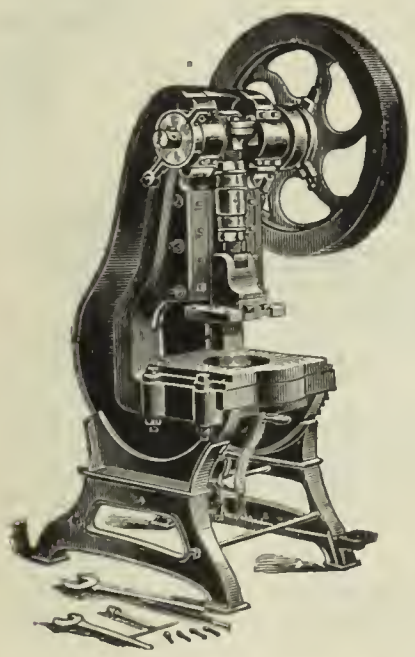

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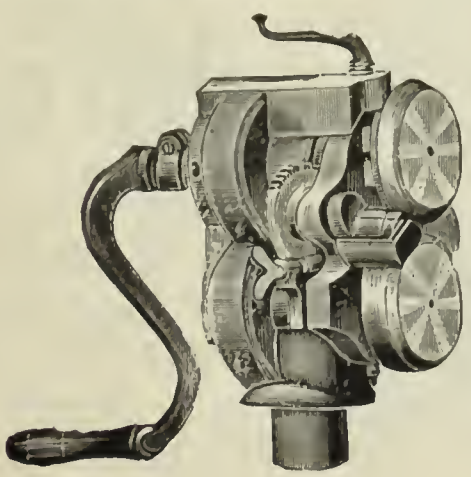

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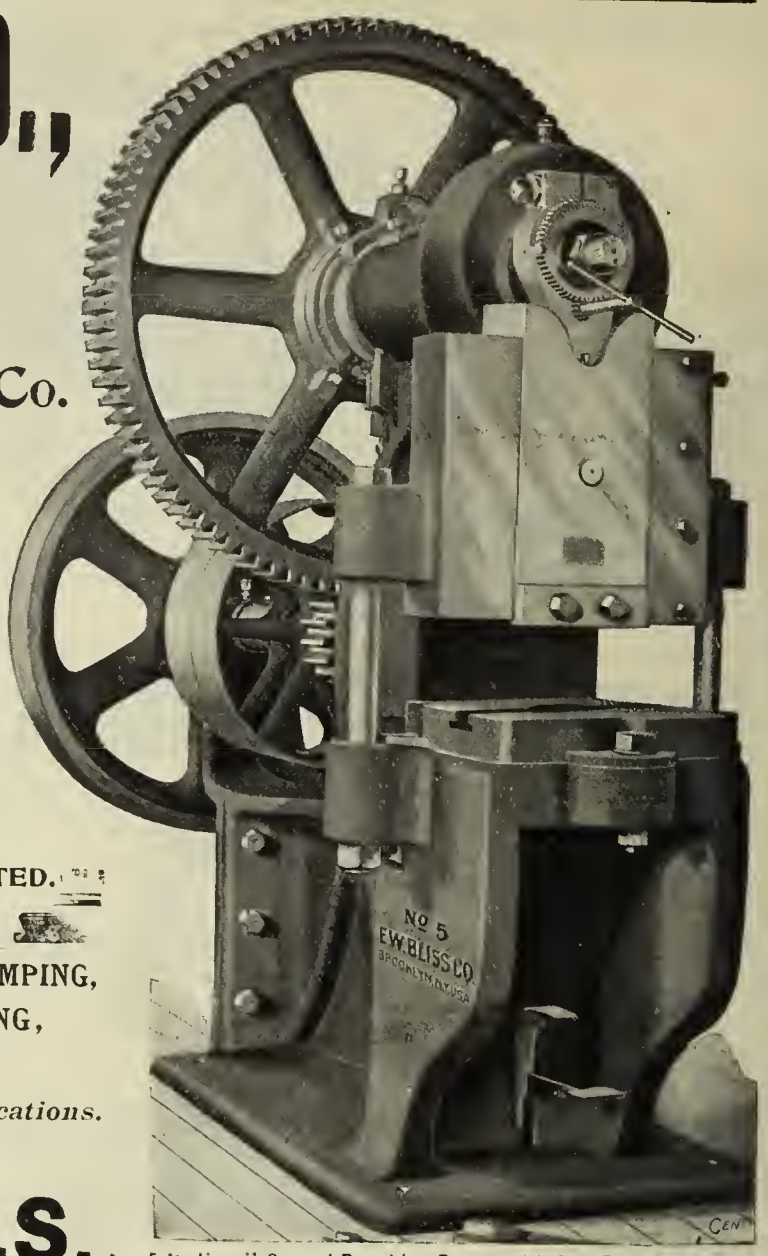

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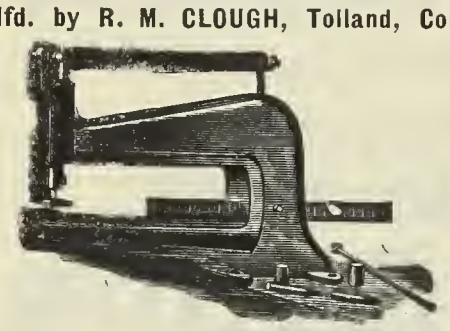

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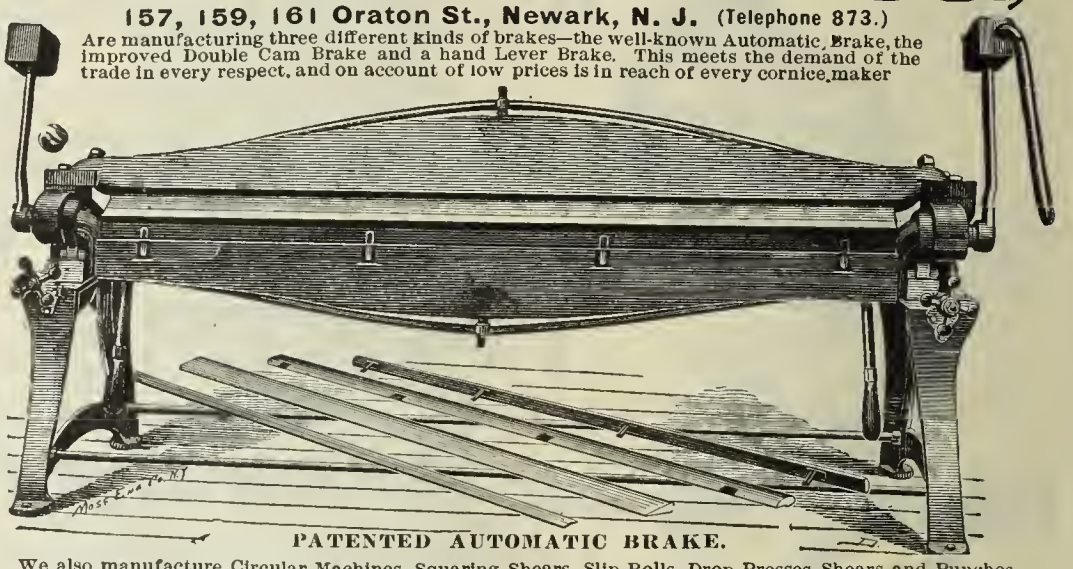

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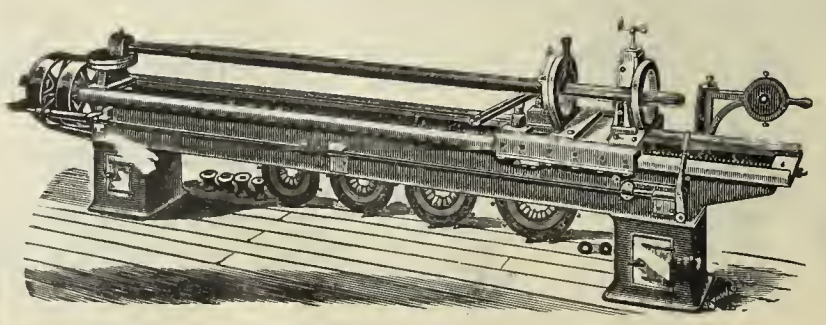

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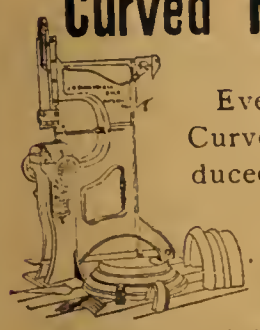

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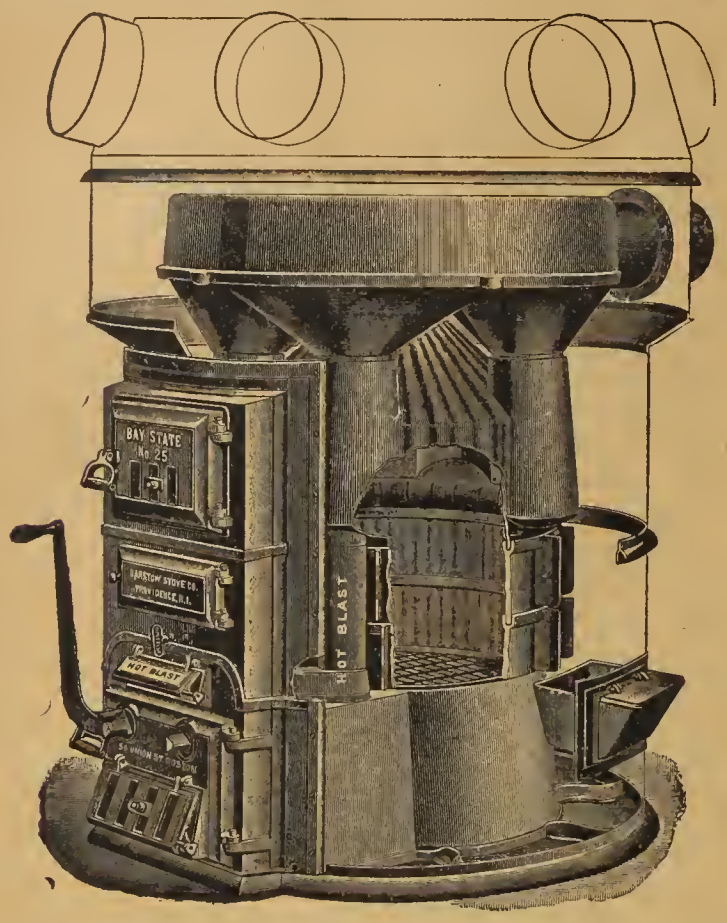

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We furnish these tested to 200 pounds and guaranteed against collapse, and for use under heavy pressure. They cost a little more than iron, but are not only more durable but have a value as old copper which is a handsome percentage of cost.

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EVERY SQUARE INCH OF

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Of this FURNACE is

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Sell our apparatus in 1898 and your year's furnace business will prove both prosperous and satisfactory.

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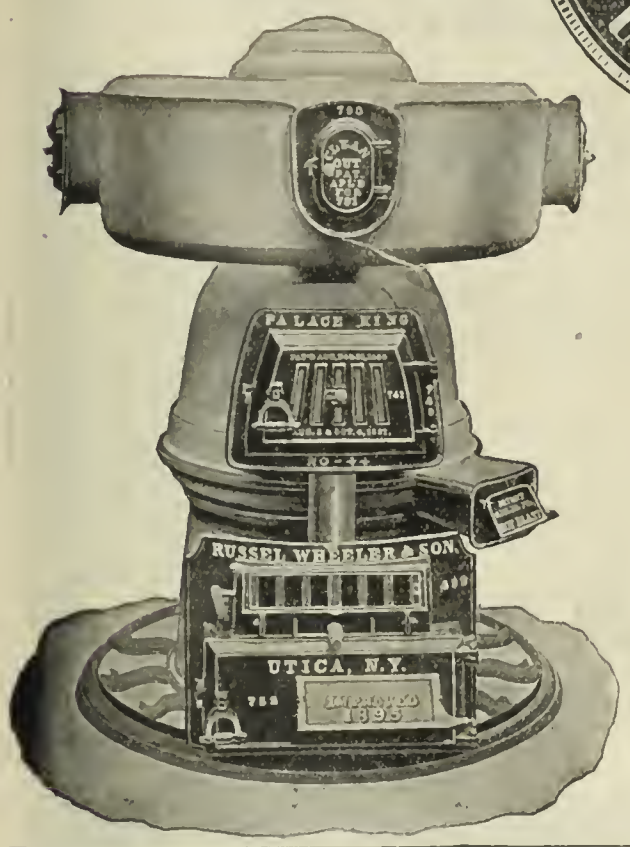

Clear, cold weather outside, and the house warm within, makes Christmas seem like

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Very truly,
I. N. EVANS.

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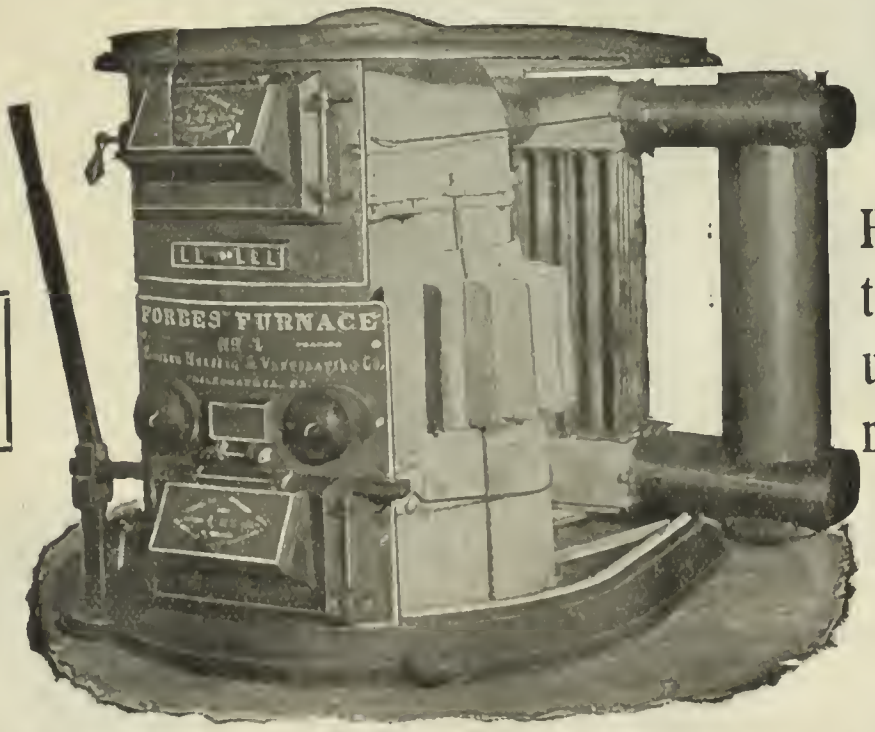

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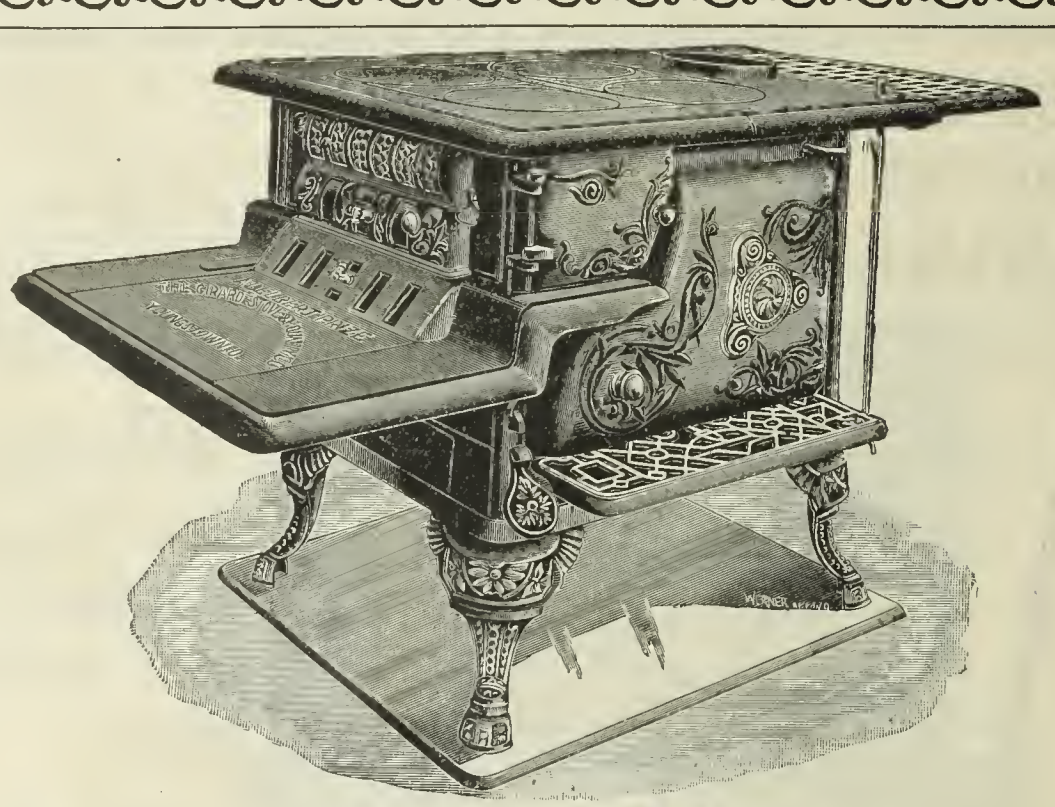

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We have a large stock that we wish to close out before January 1st, and, to do so, offer them at the following prices:

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FREIGHT ALLOWED. CASH, 30 DAYS.

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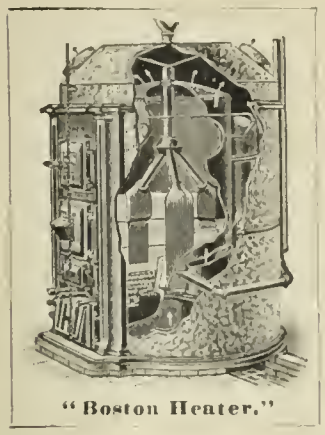
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Something **cheap** which will answer for the time, rather than **excellence** at a higher price, will sometimes **secure** trade; but it is altogether another matter to **keep** it. To do this requires you to keep faith with the public, selling only such apparatus **as has always proved reliable,** that meets **every requirement** for the most exacting work. That is why we desire you to know that the

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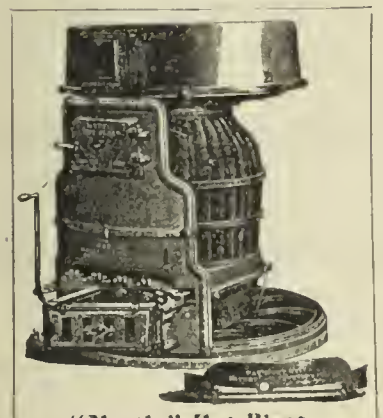
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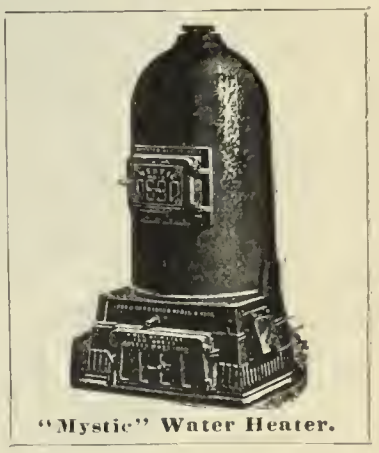
have lived a long half century—are to-day the **standard** of highest quality at the lowest cost—their sales are larger than ever before—are the nearest present approach to what a cooking or heating apparatus should be—their great popularity has been gained by making no promises not borne out by the facts—men and women who desire the best have confidence in them because they have always proved reliable. We are sure an investment in the "Magee" line will be mutually profitable.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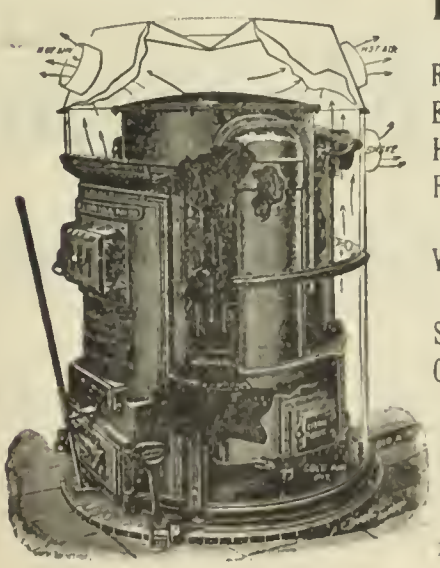

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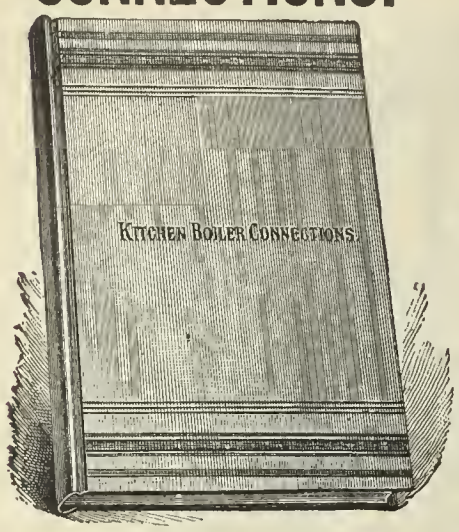

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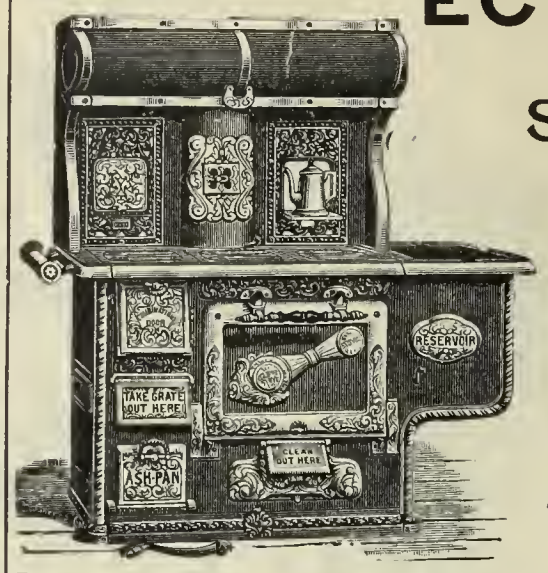

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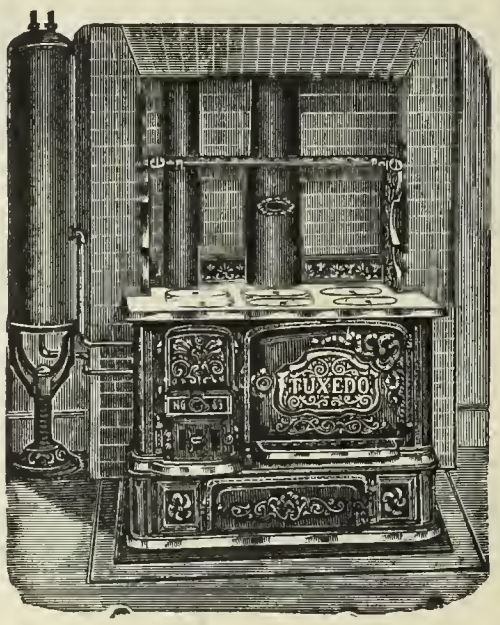

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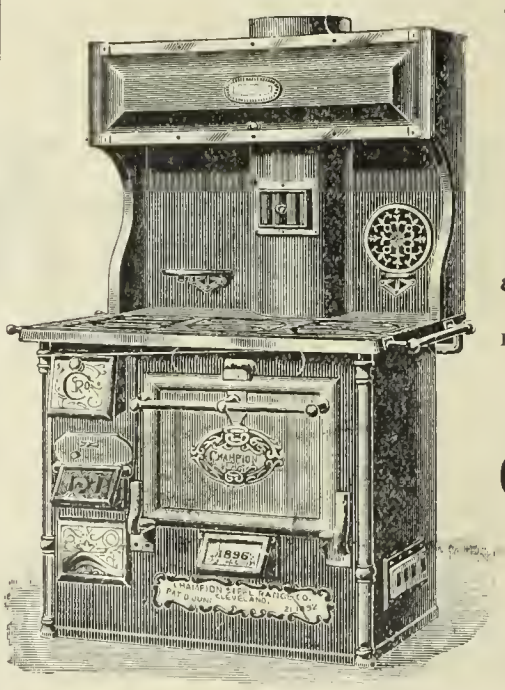

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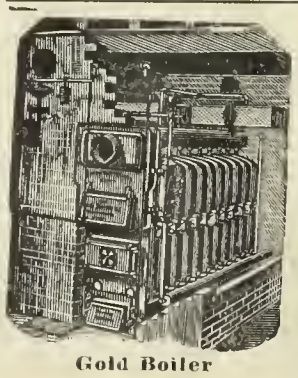

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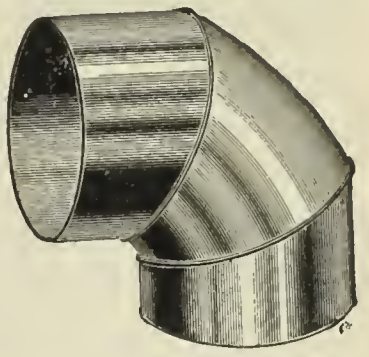

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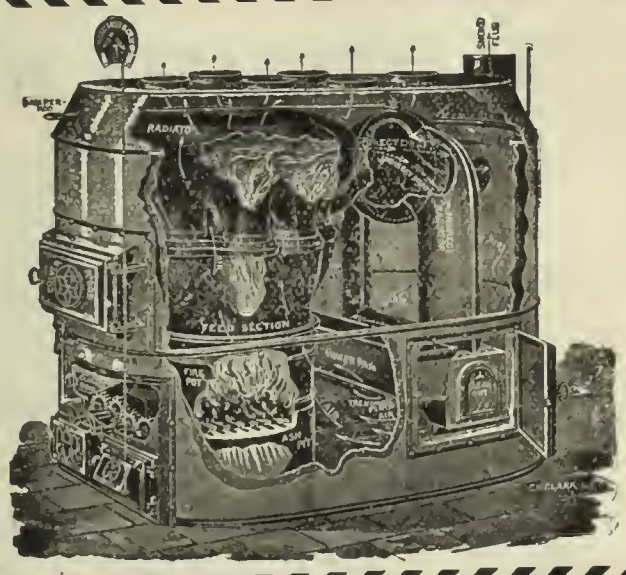

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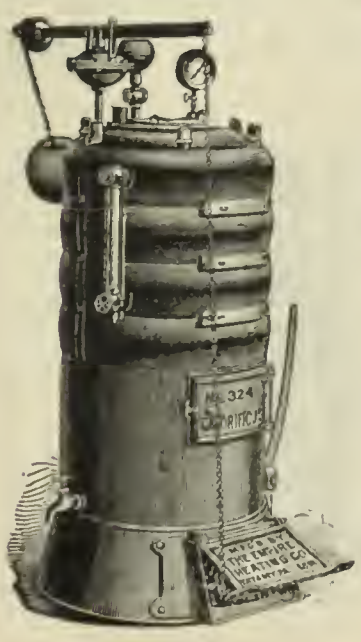

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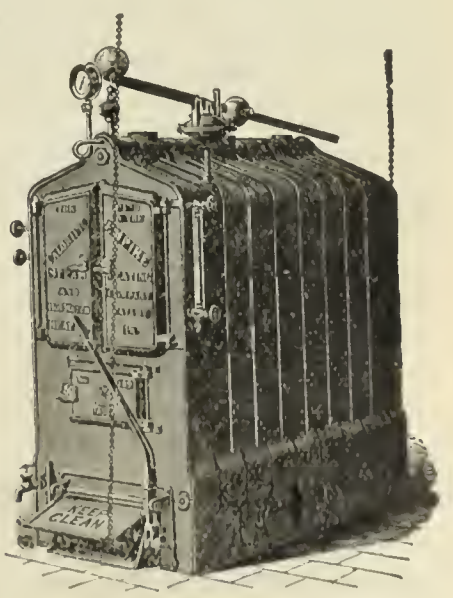

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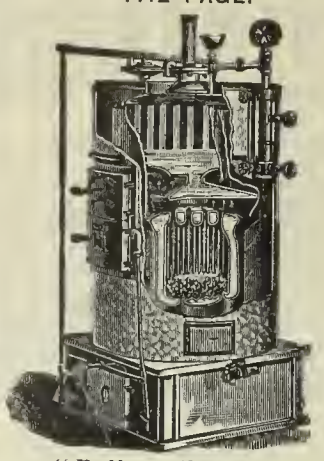

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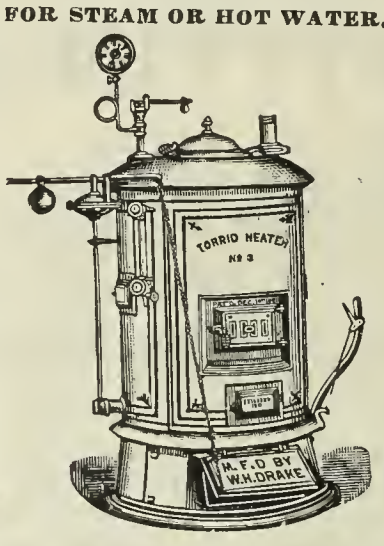

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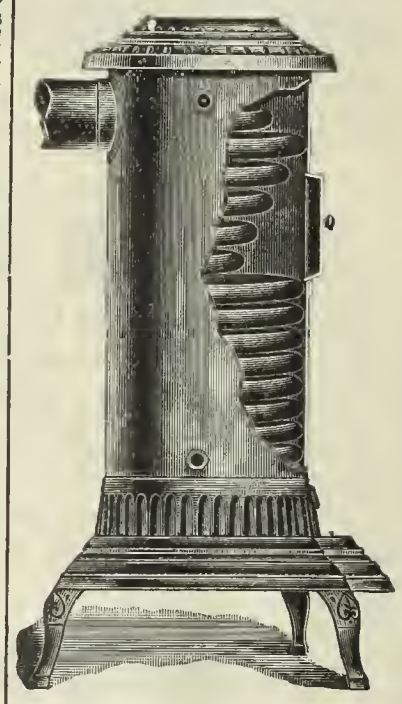

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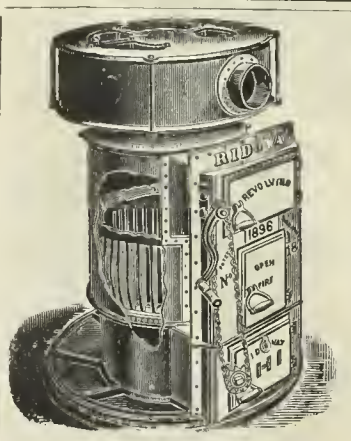

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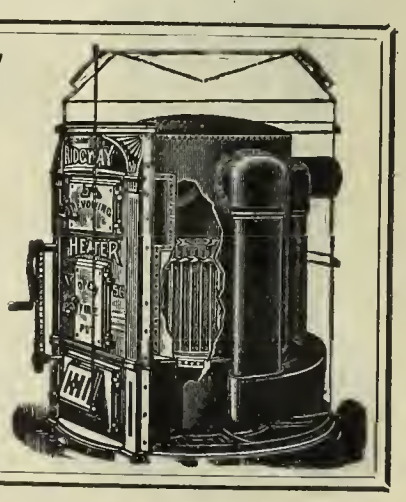
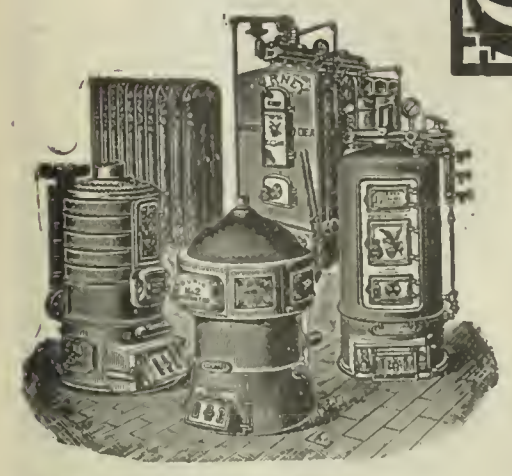


1897 **Gurney** 1897



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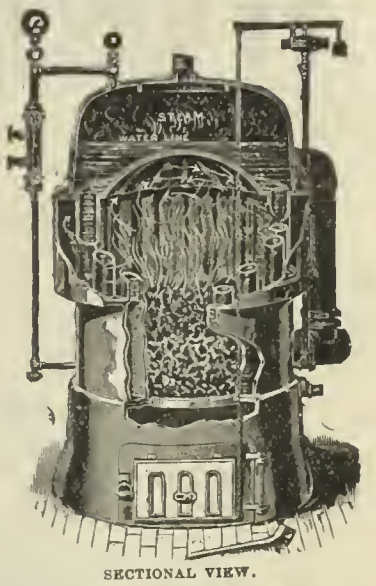

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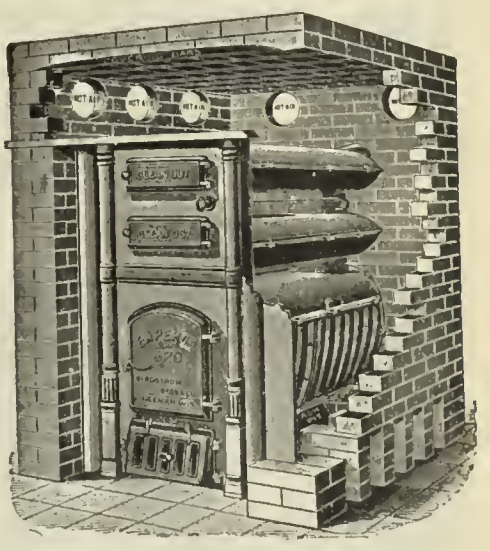

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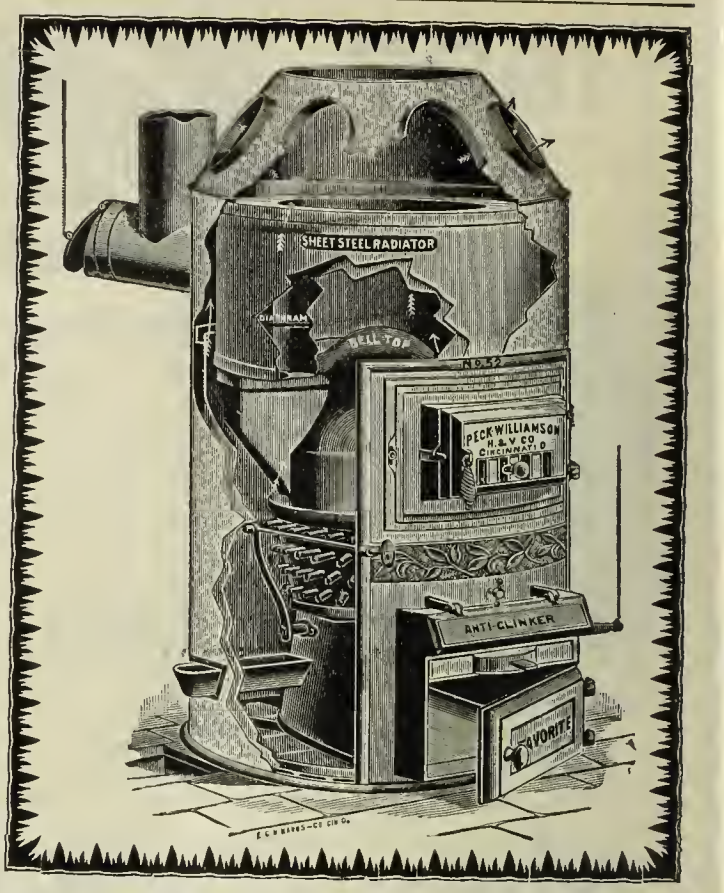
The **Thermostat Plate** is placed on the wall of a living room and operates solely by power obtained from contraction and expansion of metals. By means of a connection over pulleys it automatically operates the **Cylinder Damper** connected to heater **GUARANTEED**

Without a Defect



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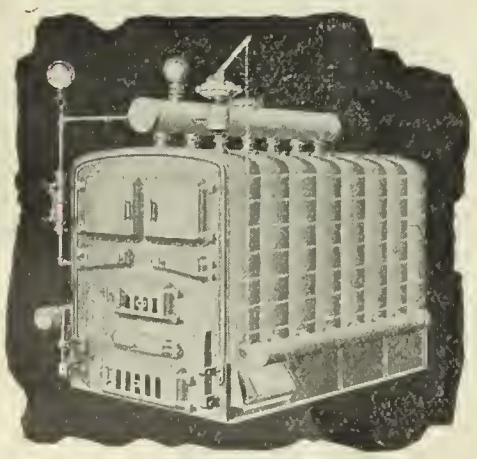
no bricks.

The outer surface of each section of this heater has cast iron ribs, which allow the boiler to be completely covered with asbestos cement—if that is desired. The use of the



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does away with the usual large amount of cumbersome brick-work required in setting a horizontal tubular, or other type of heater, in which the firebox is formed of brick. That means a saving of room and a saving in cost of apparatus.

American Boiler Company

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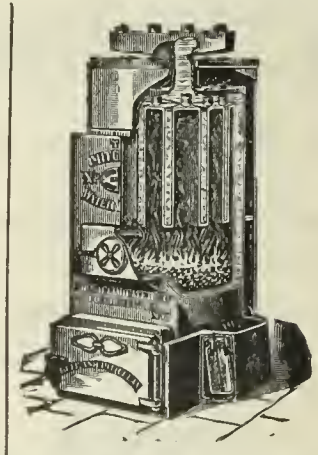
—PAT—"Oi niver heard yez whistle so well as yes did last night, Dennis."
Dennis—"Ah! I've a great patent, Pat, Just before me time came on th' programme, Oi ate a persimmon."—*Detroit Free Press.*



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Has no Joints to Burn Out or Leak.

Heating Surface all in One Casting.

Water Passages all Vertical.

Largest Amount of Fire Surface.

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Is constructed on the same general principle, but arranged to be used without jacket.

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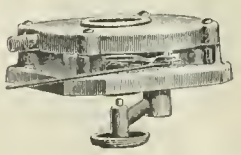

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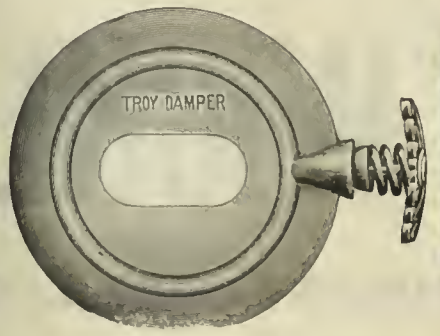
"TROY" Stove Pipe Damper.



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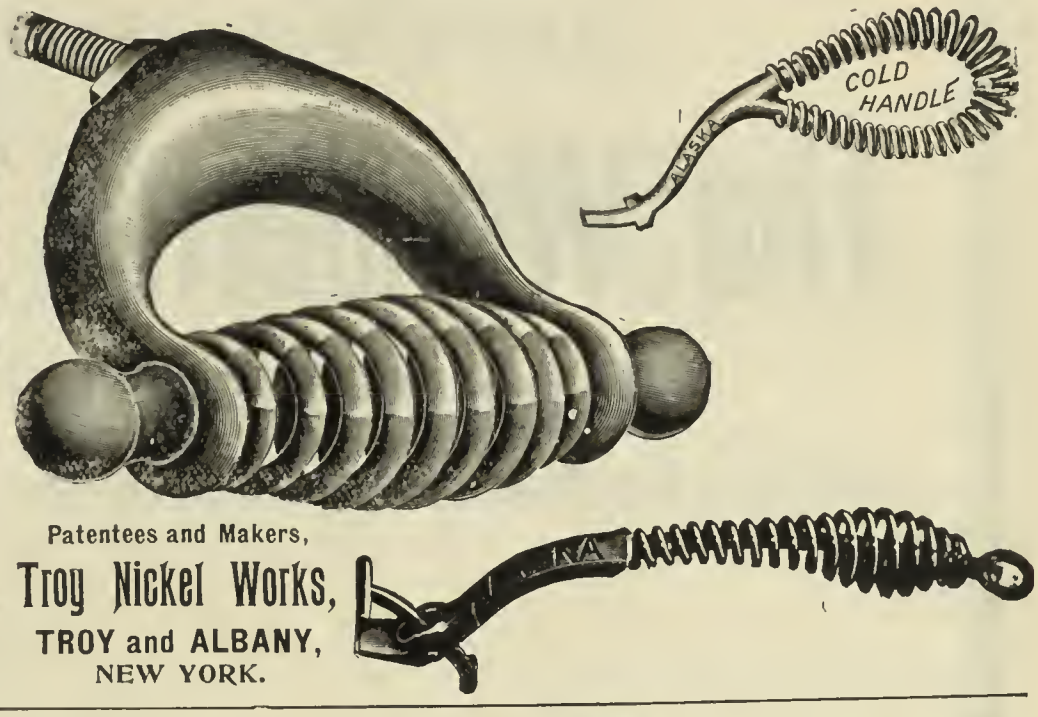

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MADE IN THE BEST MANNER
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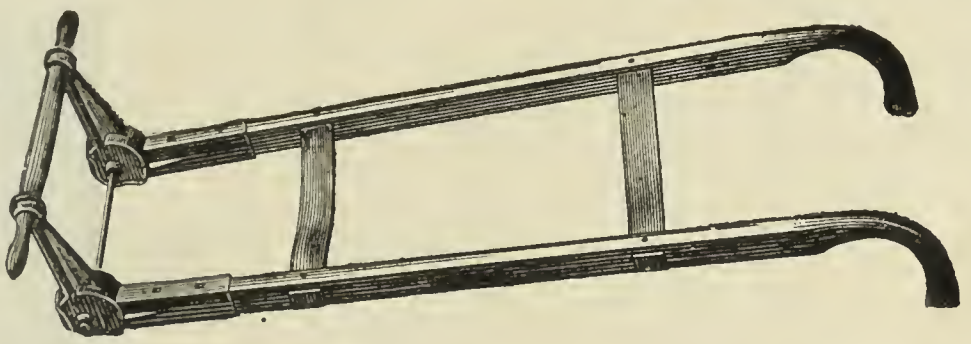

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No Complicated Machine, SIMPLE. SAFE, ECON

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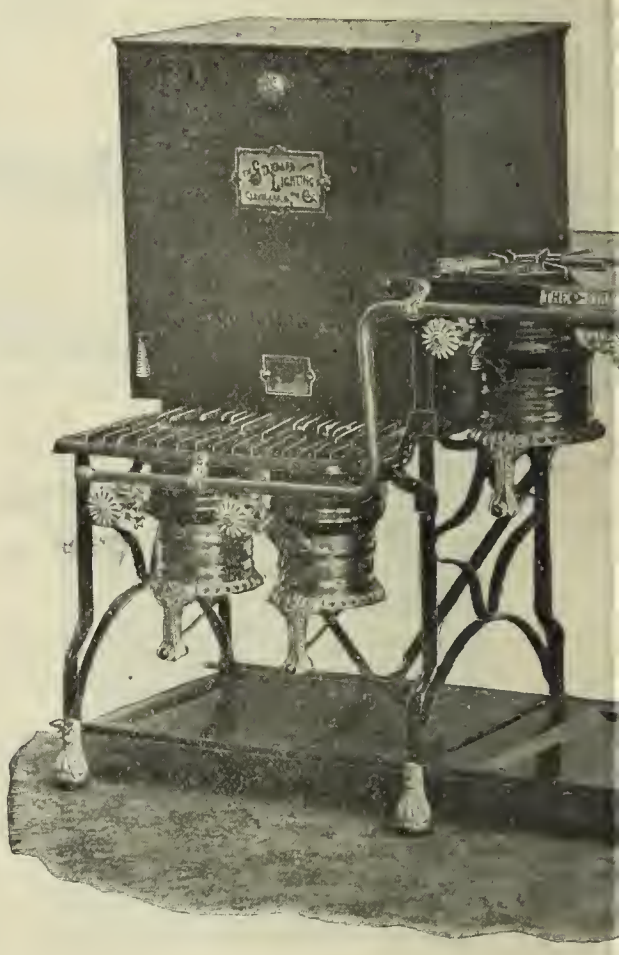

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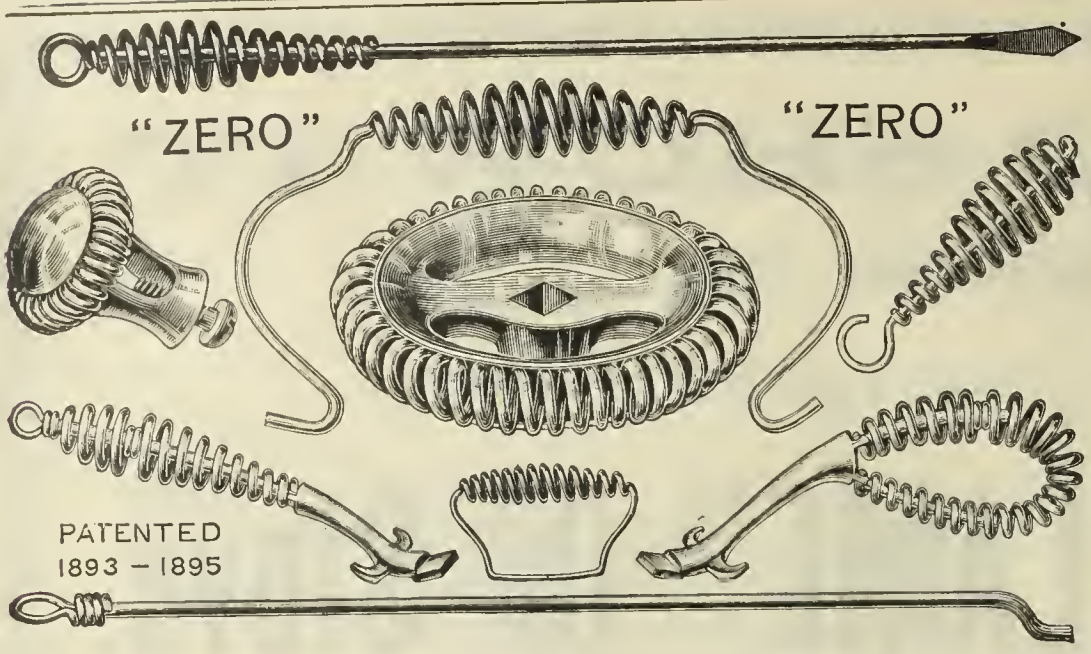

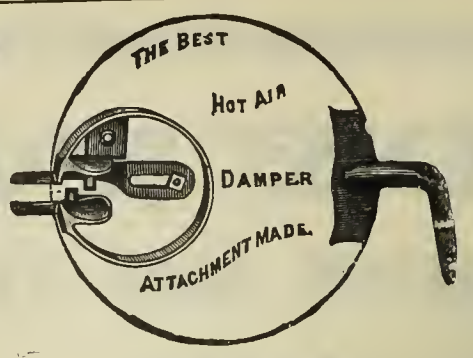

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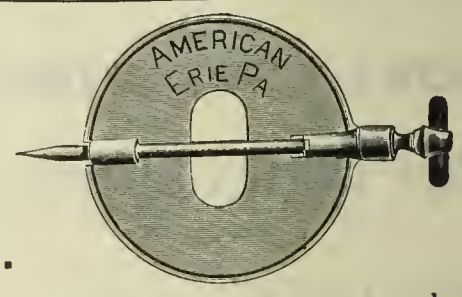

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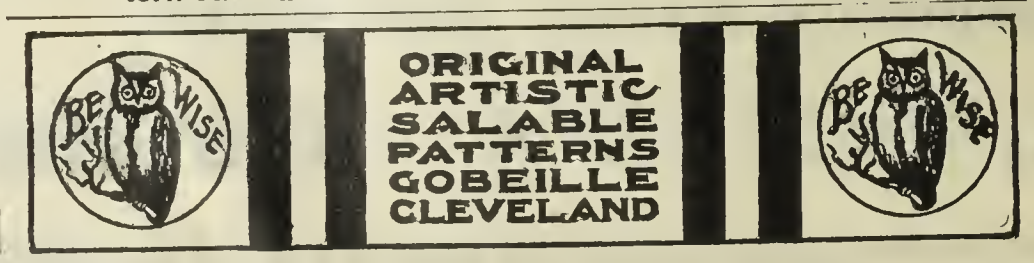

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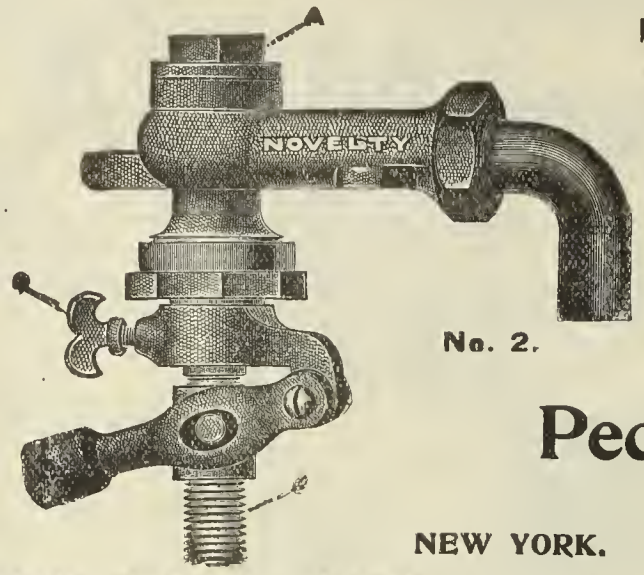

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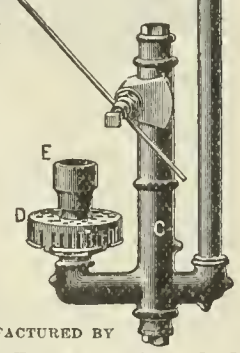

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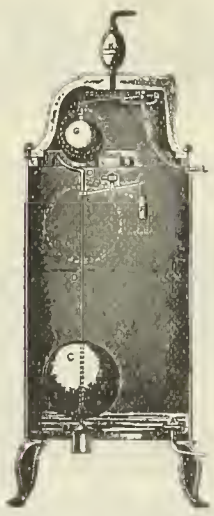

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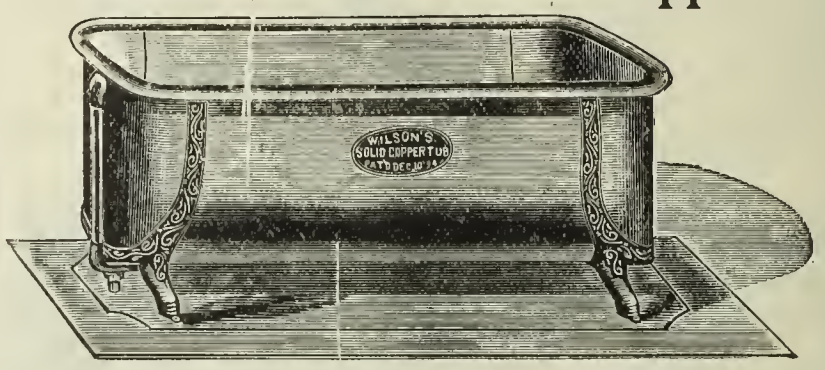

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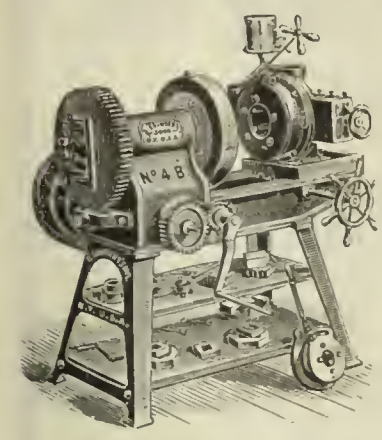

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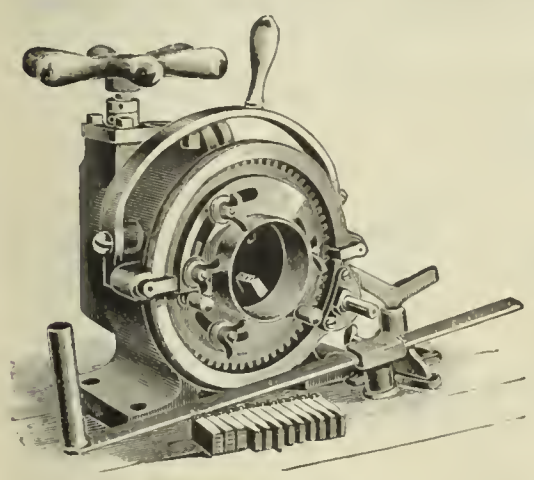

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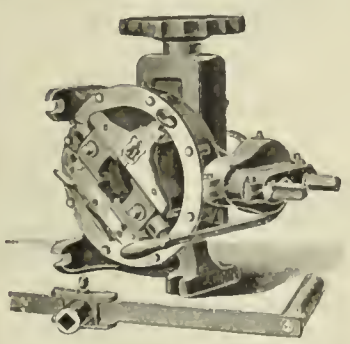

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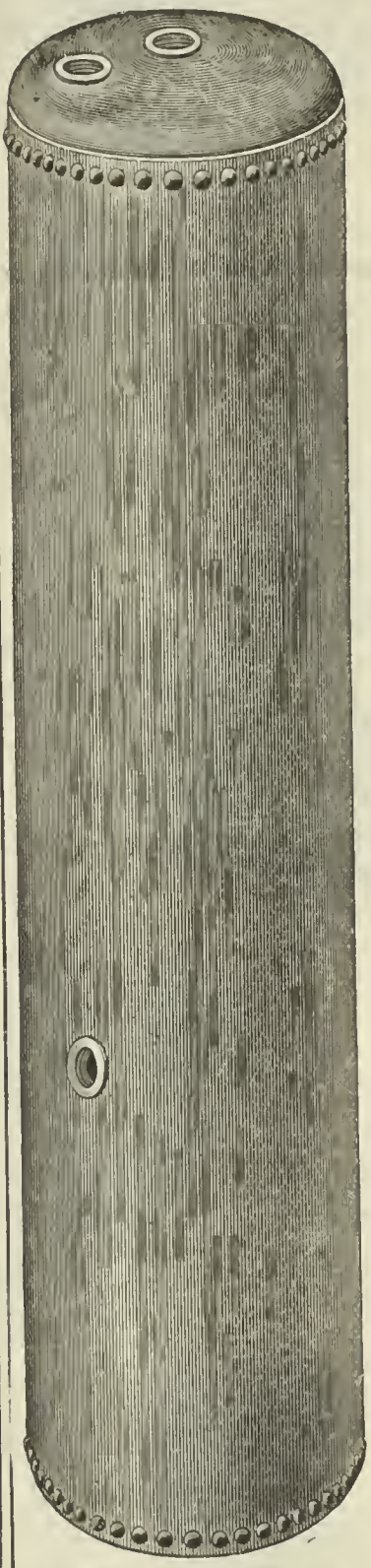

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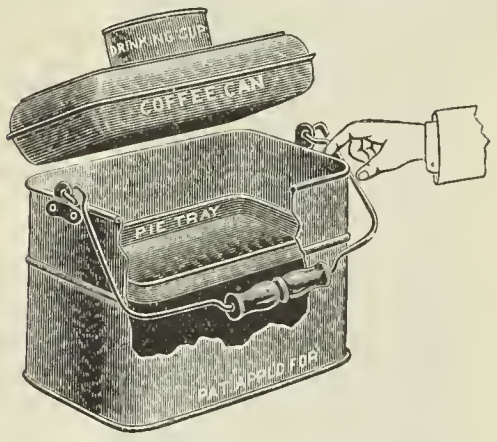

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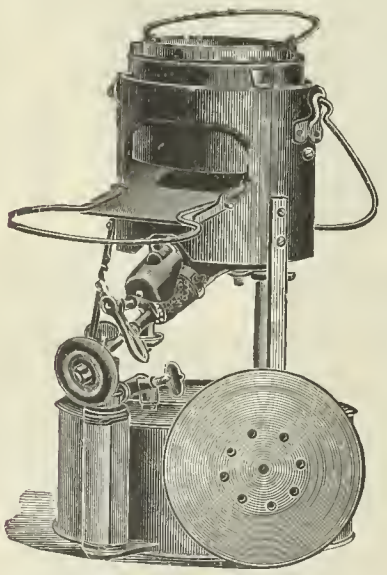

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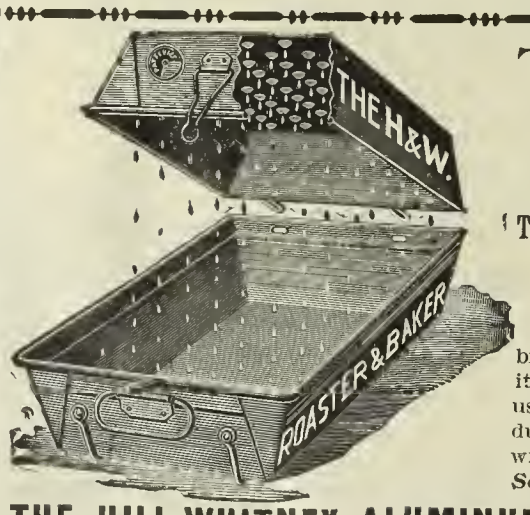

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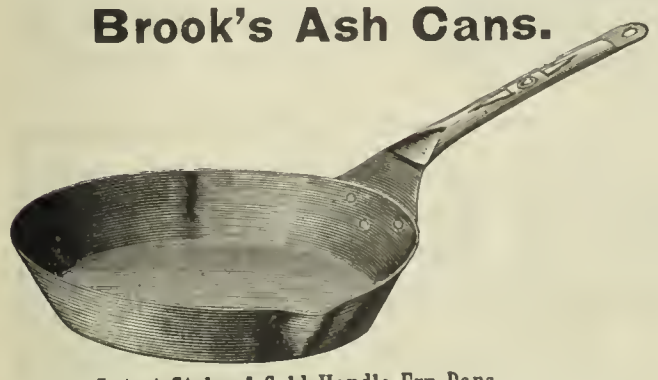

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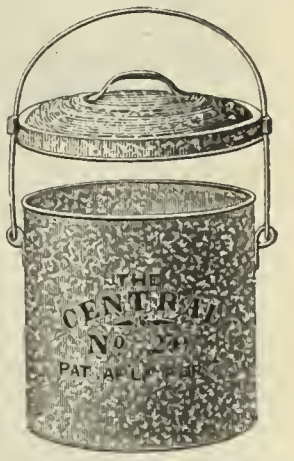

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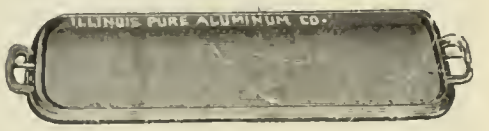

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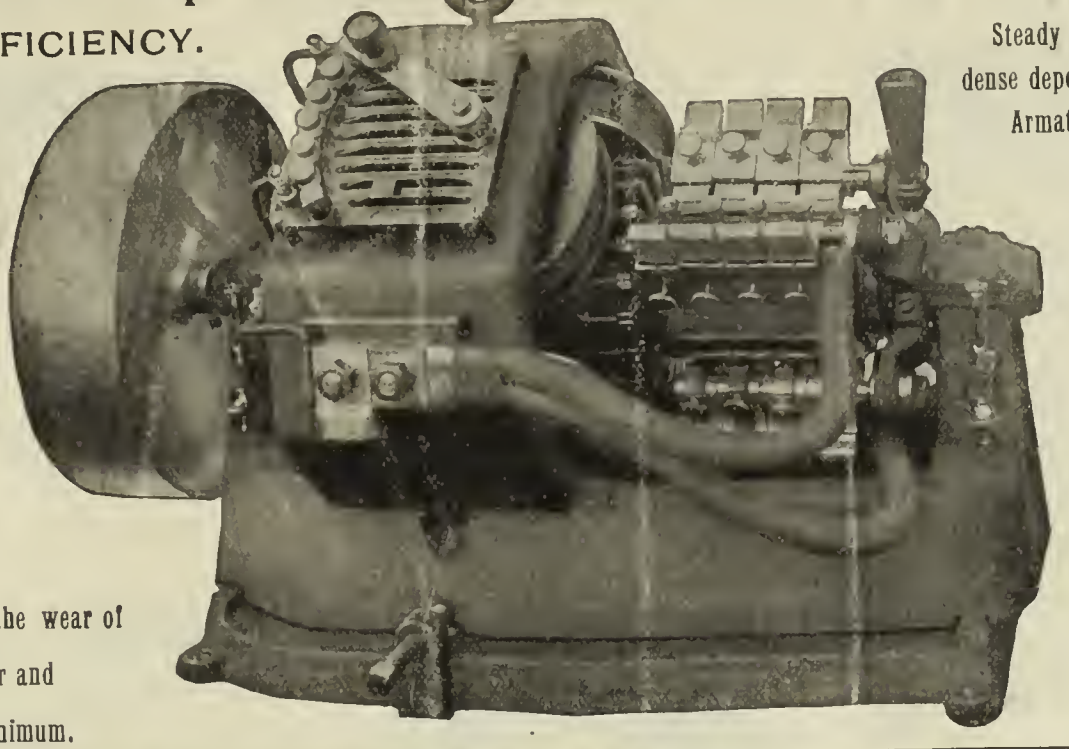

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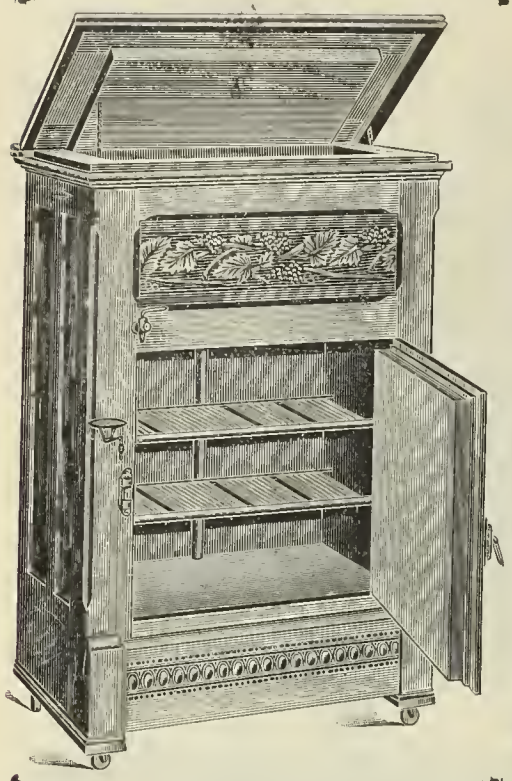

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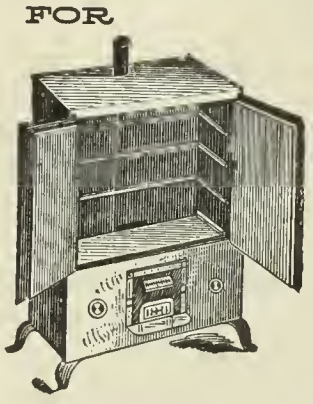

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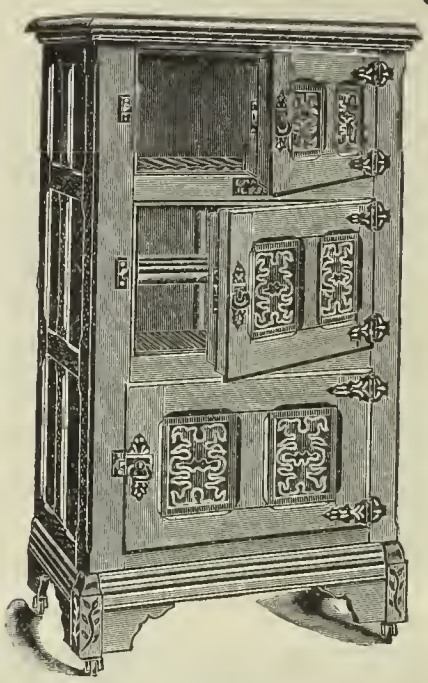

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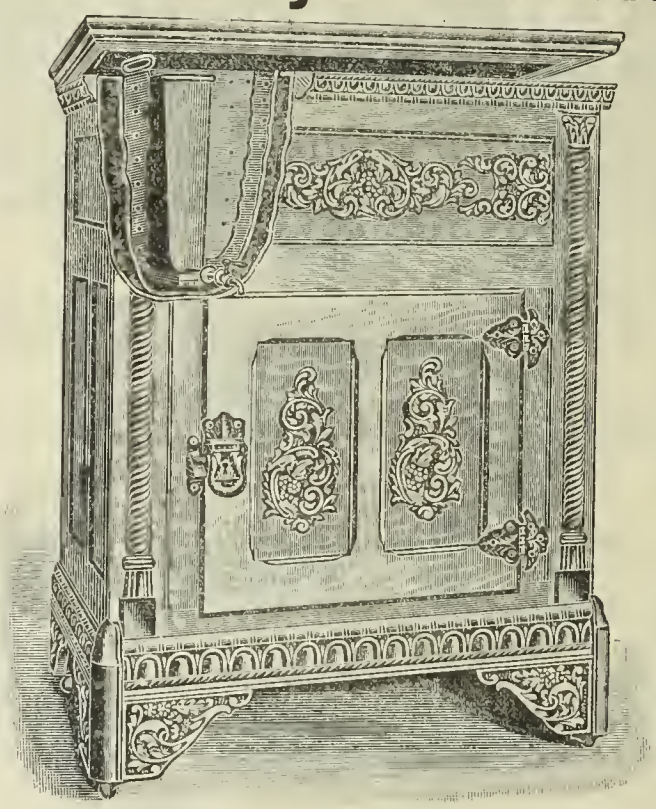

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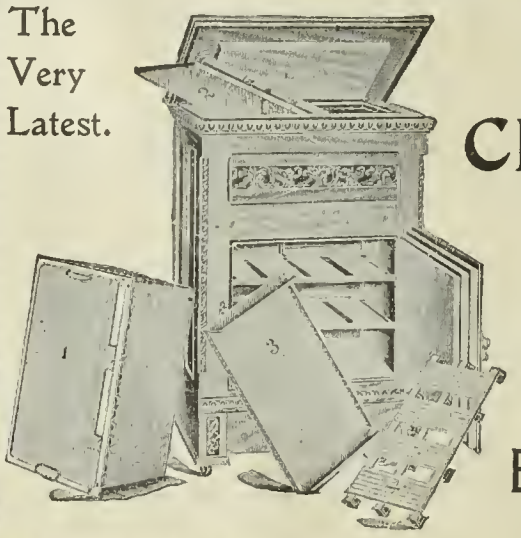

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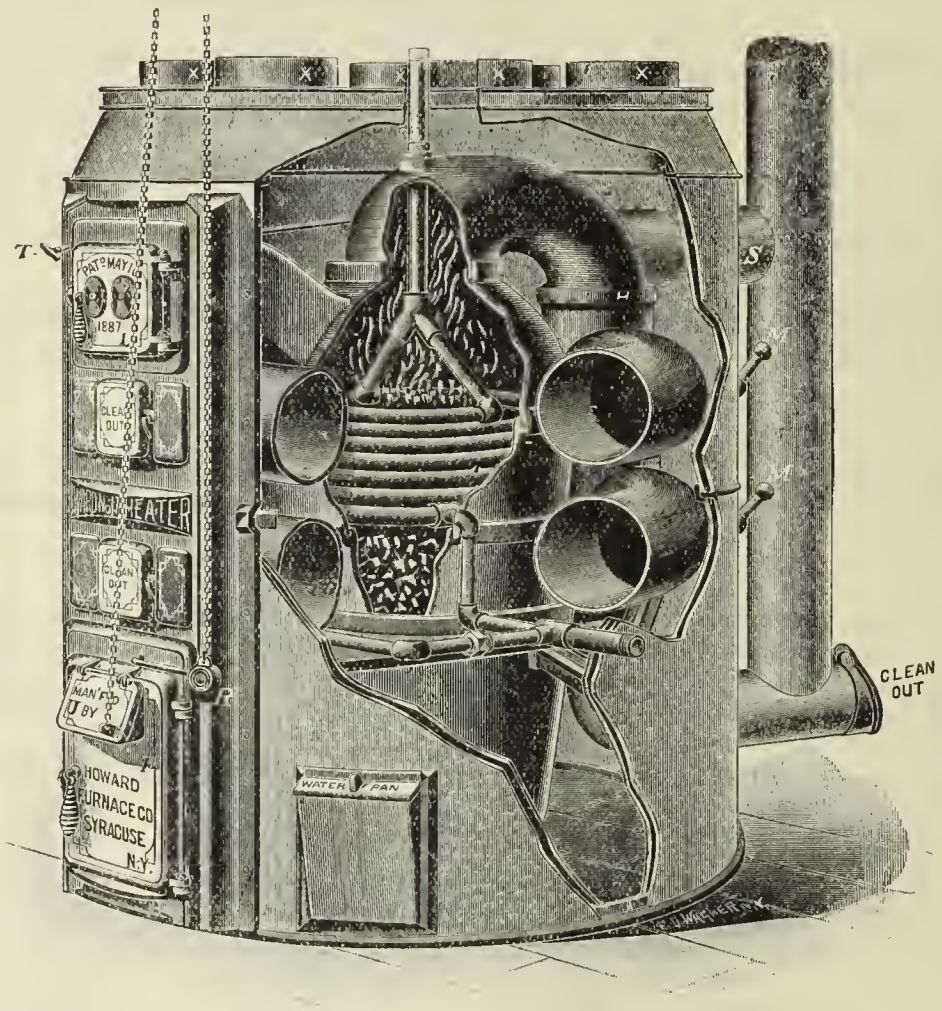

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Index to Reading Matter.....Page 53.

The Business Situation.

The familiar salutation, "A Merry Christmas and a Happy New Year," should, at the present time, strike a more cheerfully responsive chord in the business world than has been the case in several years past. Circumstances conspire to give to this season a brighter aspect than it has borne since the panic of 1893. The current volume of business is larger than that of 1892, the last year of real activity, and the conditions now ruling are even more favorable than at that period. Capital and labor are both better employed. The ranks of the active workers are fuller and more mills and factories are in operation. Bountiful crops and an immense foreign demand for our agricultural products, together with high prices for wheat, have favored the great farming community and placed them in easy circumstances. Exports of manufactures have broken all previous records, leaving an enormous balance of foreign trade in our favor. Europe is borrowing money from this country at a time when gold is usually being exported to pay our obligations. The weekly records of bank clearings are phenomenal for the season. Railway earnings, that unerring gauge of general trade, are showing remarkable gains from week to week. The foreign relations of the country are undisturbed by any menace. Best of all, the clouds of distrust and lack of confidence which have exerted so depressing an influence over business for years are dissipated, and on all hands hopeful anticipations are expressed in regard to the outlook for business in the coming year. The present, therefore, should be a season of rejoicing to many in whose ears the old Christmas greeting has rung with an uncertain sound in previous years. The past week, as is natural, has shown a sensible falling off in wholesale lines of trade as the holiday season and the annual stock taking period approaches. But the retail trade, particularly in holiday goods, is reported in all quarters to be of a most satisfactory description and far ahead of recent years. The volume of general business last week, as shown by the returns of bank clearings, was 26 per cent. greater than that of last year at the same time and 2.5 per cent. above the figures for 1892, and the present week is likely to make as good a showing. The speculative markets reflect the usual ante-holiday quietness, with no radical changes in prices. Local money rates have stiffened, owing to the large shrinkage in the cash holdings of the city banks, due to a cessation of the eastward flow of currency from the interior and to preparations for January interest disbursements. Otherwise there have been no financial changes worthy of note. The metal markets are throughout dull and featureless.

The Future of Business.

The natural, but on the whole unwise, desire of human nature, says *The Iron Age*, to unveil the future has in the case of the business man the good reason that the wise conduct of his affairs necessarily implies a forecast of what is likely to happen in the near future. To that extent at least an inquiry of this nature is both reasonable and proper.

If it is the unexpected that always happens, it is not because events are not the logical result of cause and effect, but becuse of the immensity and complexity of the problem as presented to human intellects. Not only can we never hope to grasp all the innumerable threads that make up the apparently tangled skein, but we can never be sure, mathematically speaking, which are the constants and which are the variables in the equation. If, like the Weather Bureau, only a moderate percentage of our foreeasts prove correct, we have done well and should be content.

There were not wanting long headed men to foretell the panic of 1893, and it did not require much knowledge of the past to deduce for the future the facts of the loss of business confidence, the craze for cheap money, the popular unrest and discontent and the business paralysis which are the inevitable accompaniments of hard times. Any attempt to in the least tell of the likelihood of coming events must be based upon a study of the past and the consequent law of probability as to history repeating itself. This is rendered apparently hopeless by the evident fact that we stand upon the threshold of a new era, and that in its essential features it promises to be foreign to all previous human experienees.

The most abiding effeet of the panic of 1893 was the sudden and complete severance with our commercial past and the discarding of those inheritances of war times—the happy-go-lucky methods of buying and selling, the unquestioned belief in regularly recurring cycles of boom and speculation, the lack of economy in production and the extravagance in distribution, the prevalence of great margins of profit, and the blind confidence that the future was an inexhaustible fund, against which we could always draw in the way of constant multiplication of machinery and of factories.

Three years of distress and agitation have not only brought us to a realizing sense of changed conditions that are both world wide and permanent, but have also set us on the road to the satisfactory adjustment of ourselves to our new environments.

First of all, it is clearly seen that for us at least the root of the matter lies in the question of distribution. The bugbear of a constantly increasing expense account that will not down can only be solved in part by economies in production. A liberal outgo

must be at once the precursor and cause of a large incoming, and false economies in the various methods of keeping the goods before the public mean only too surely a falling off in demand. Reductions of salaries and wages are only too often at the expense of efficiency, and are becoming daily more impracticable, save in the temporary stress of emergencies. We no longer accept as an economic maxim the "Iron Law of Wages," which proclaims a constantly decreasing earning power on the part of the individual, for the trend of facts is distinctly in the contrary direction. Nor can we shut our eyes to the fact that the great mass of humanity is aware of its growing power and will certainly never voluntarily consent to a reduction in the standard of living. Whether wages increase or values decrease the benefit to the consumer is the same.

The carefully wrought theories which tell of the inevitable reduction of the wage earner to the condition of a mere serf are certainly not in accord with the experience of the last twenty-five years, nor do they find support from any intelligent examination of the changed conditions of the commercial world. If their business is to continue profitable—and upon this fact rests the entire fabric of commerce—where is relief to be found from the unrestrained competition of the day?

Competition certainly has its hard and cruel side, and it is that which gives vitality to the socialism of the times, yet experience forbids us to expect any comfort from those communistic theories which seek to suppress competition altogether, and which are so alluring in theory and so impracticable in operation. At present everything seems to point to the solution by means of intelligent distribution which in the main shall make competition both unnecessary and impossible. All the indications of the times point toward the aggregation and consolidation of great interests, both manufacturing and distributing, to an extent never known before, and in all the various schemes there are no signs of any attempt to advance prices.

The unutterable folly of the opposite plan of making a lot of money in a short space of time seems to be at last thoroughly recognized. Indeed, it can be said of those organizations which have steadily kept the interest of the consumer in view, that they appear to be founded on a rock. Up to date they have successfully resisted alike the attacks of all competitors and the virulence of political assaults. A steady reduction in the price of the articles which they control has been accompanied by an ever increasing profit account.

A discussion of the methods of these combinations, whether for good or bad, does not come within the scope of this article, but the most ardent socialist would find it difficult to present any other practical plan which would be of greater benefit to either producer or consumer. Chimerical as some of these schemes of consolidation may appear to us, they are not confronted with any obstacles more formidable than the short sighted greed of the owners of some plants, and the question of the satisfactory disposition of prominent individuals, for all other questions are principally mere matters of detail. Our export trade will naturally be a large factor in the problem and one whose importance will increase with each succeeding year. It is probable that agriculture will always be the most important interest in our own country, but its relative importance will certainly diminish with the growth of our export trade in manufactured articles. We are gradually losing our fear of the bugaboo of cheap foreign labor, and are slowly realizing that we hold the key of the position, since there are no indications that European manufacturers will ever displace us in the van of progress.

It is easy and natural to indulge in bright visions of our future in this direction, forgetful of the long intervening years of hard and patient labor that are required, yet indications are not wanting that the commercial supremacy of the great English nation is slowly being transferred to her greater offspring on this side of the water. Bold as the assertion may seem, the matter of declining prices is one that need not give us concern, since it is comprehended in that of satisfactory distribution.

There is, however, one bridge we shall soon have to cross, and it must occupy our most earnest thought. It is only a truism to state that we can never enjoy permanent prosperity until our currency is settled upon a firm and enduring basis. So far as the free coinage of silver is concerned, the best thought of the nation inclines to the belief that as an issue it will never again assume the potency and danger that it displayed in 1896. The steady drift of all the world is so unmistakably toward the single gold standard that it would be contrary to all reason and experience for us to fly in the face of progress and take a step backward into the worn out and discarded ways of he past. The decadence of the free coinage agitation is best evidenced by the fact that the principal arguments now used in its favor are those of sentiment and of alleged constitutionality. It has in fact reached the doctrinaire period of its history. The danger consists not in the strength of the free coinage movement as such, but in its being joined with those other issues of unrest and discontent which arise from the period through which we are passing. Our best hope is that an era of prosperity may allay these causes of irritation until we can find time and opportunity to place our currency system upon a stable basis. Meanwhile, the general confidence in the future grows apace and each week witnesses a spreading of the conviction that 1898 holds in store for us better things than we have known for four years. Barring those unexpected changes that it is not in the power of man either to foresee or to prevent, there seems good ground for the reasonable expectation that we are entering upon a period of prosperity that shall recompense us all for our past misfortunes.

The tremendous preponderance of exports in our foreign commerce is a frequent subject of congratulation in trade circles. The month of November showed an excess of merchandise exports over merchandise imports of $64,277,959, and the record for December is likely to run about the same, if not a little more strongly in our favor. The balance of trade on merchandise exports and imports for the calendar year 1897 is expected to come very close to $350,000,000 in favor of this country. This will surpass anything ever before shown in our history. Taking the 27 months ending with December, the aggregate balance of trade in favor of the United States will be over rather than under $800,000,000. These are stupendous figures. Looking at them, it is little wonder that American bankers are loaning money in Europe.

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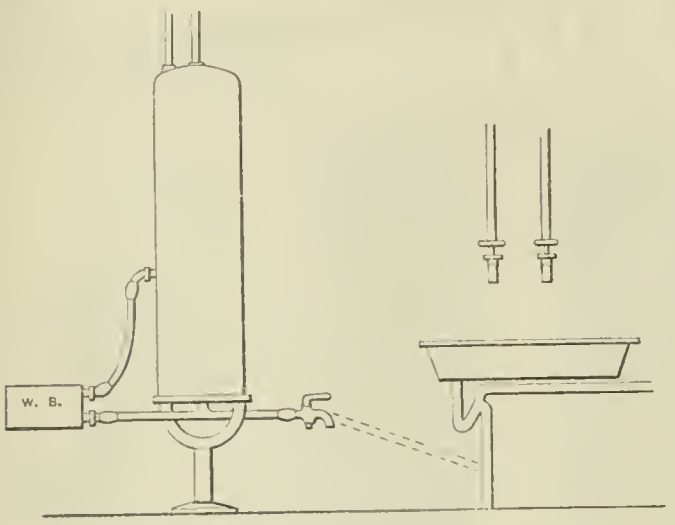
* According to mail advices received at San Francisco, Cal., the great fire in Melbourne, Australia, on November 22, was much more destructive than was indicated in the brief cabled report of the occurrence. A large area of the warehouse center of the city was completely demolished, with a total damage of $7,500,000.

THE LETTER BOX.

Is It Dangerous?

From J. T., Hackensack, N. J.—Recently I was called upon to do some plumbing work in a house and found in the kitchen that the boiler was provided with a sediment cock at the bottom, so that in case of any accumulation of mud in the boiler it would be washed out; but the woman in whose house this was found wanted me to put in a different kind of cock, as she expressed it, and run the pipe over to the waste pipe under the kitchen sink and connect with it, as shown by the sketch. I told her I would see about this, and on talking with my employer he refused to do it, on the ground that such a connection would not be sanitary, as under some conditions when the sediment cock was opened the boiler might be emptied and sewer gas fill the boiler and the water pipes in the house. On reporting this she said the boss didn't know



Is It Dangerous?

his business, that the house she had just left for the one she now occupied had just the character of arrangement which she wanted me to make, and if I did not do it she would get some other plumber to do it. Her principal reason for having the connection made was that in the winter season, with the best of care, more or less grease would get into the waste pipe from the sink and have a tendency to choke it up. But when she used a strong solution of lye and poured it into the waste pipe and let it remain there for a time, and then, with a good fire in the range, so that all the water in the boiler was hot, she opened the sediment cock sufficiently to let hot water pass into the waste pipe, it would clean it out nicely, and that, so far as any danger of it being unsanitary was concerned, she could speak from experience that such a conclusion was all nonsense. I have reported this to my employer, but he still sticks to his old conviction and I would liko to know which is right. I hope that plumbers who have had experienco in this line will speak either for or against this form of connection.

Rule for Furance Pipes.

From C. W., Newark, N. J.—I have been a close reader of all that *The Metal Worker* has provided for the asistance of those who make a specialty of hot air furnace work, and submit for the consideration of its readers the following on deciding the size of hot air pipe to be used for a given room. The rule which must be applied, with variations to suit the location of the room and its size, is to multiply the square feet of floor space by 2½, 3, 3½ or 4, then divido the result by 10, and the result will be the area in square inches of the hot air that should be used. For example, a first floor room 15 x 15 feet, with two walls exposed and the usual windows, would have an area of 225 square feet. This multiplied by 3½ would give 787, and divided by 10 would give a fraction over 78 as the number of square inches of area that a hot air pipe should have for this room. If the room had three sides exposed on the cold side of a building the square feet should be multiplied by four. For example, a 14 x 16 foot room would have 224 square feet, and multiplied by 4 and divided by 10 would give 89.6 as the area in square inches of the proper pipe, which would be almost equal to an 11-inch pipe. If the room was to be used only as a sleeping apartment, and over a room that was warmed, either 2½ or 3 should be used as the multiplier, according to the exposure and amount of heat required. It will be seen that this rule is somewhat elastic and not derived from a scientific base, but simple in application and a fair guide. On computing the cubic contents of the rooms with a 10 foot ceiling it will be found that in the more exposed room 1 square inch of area is provided in the hot air pipe for every 25 cubic feet of space, and in the other room the proportion is about 1 to 30. It corresponds with the method of proportioning the pipe to the cubic space, but the different multipliers have an advantage to beginners, as they do not leave so much to judgment. Multiply by 4 for cold exposed first floor rooms and by 3½ ordinarily. For exposed second floor multiply by 3, and by 2½ ordinarily for sleeping rooms. These multipliers used for rooms of different sizes naturally will not always give an amount which corresponds with the area of a regular size of pipe, but will sometimes give an amount between two sizes; then the larger or smaller size may be used as the room may seem to need, or according to the number of pipes which are used on the furnace. If there is a large number of pipes on the furnace, taxing its capacity, better results will be secured by using the smaller size of pipe. Small furnaces and small pipes only do their work at the expense of overheating the air, which should always be avoided.

Air Pressure and Mercury Column.

From J. C. M., Kansas.—I want to know how many inches of mercury it takes to make a pound of air pressure on gas pipe tested with a mercury gauge. The hole in the glass containing the mercury is about 1-16 inch. The gas inspector here says that 2 inches of mercury is 1 pound.

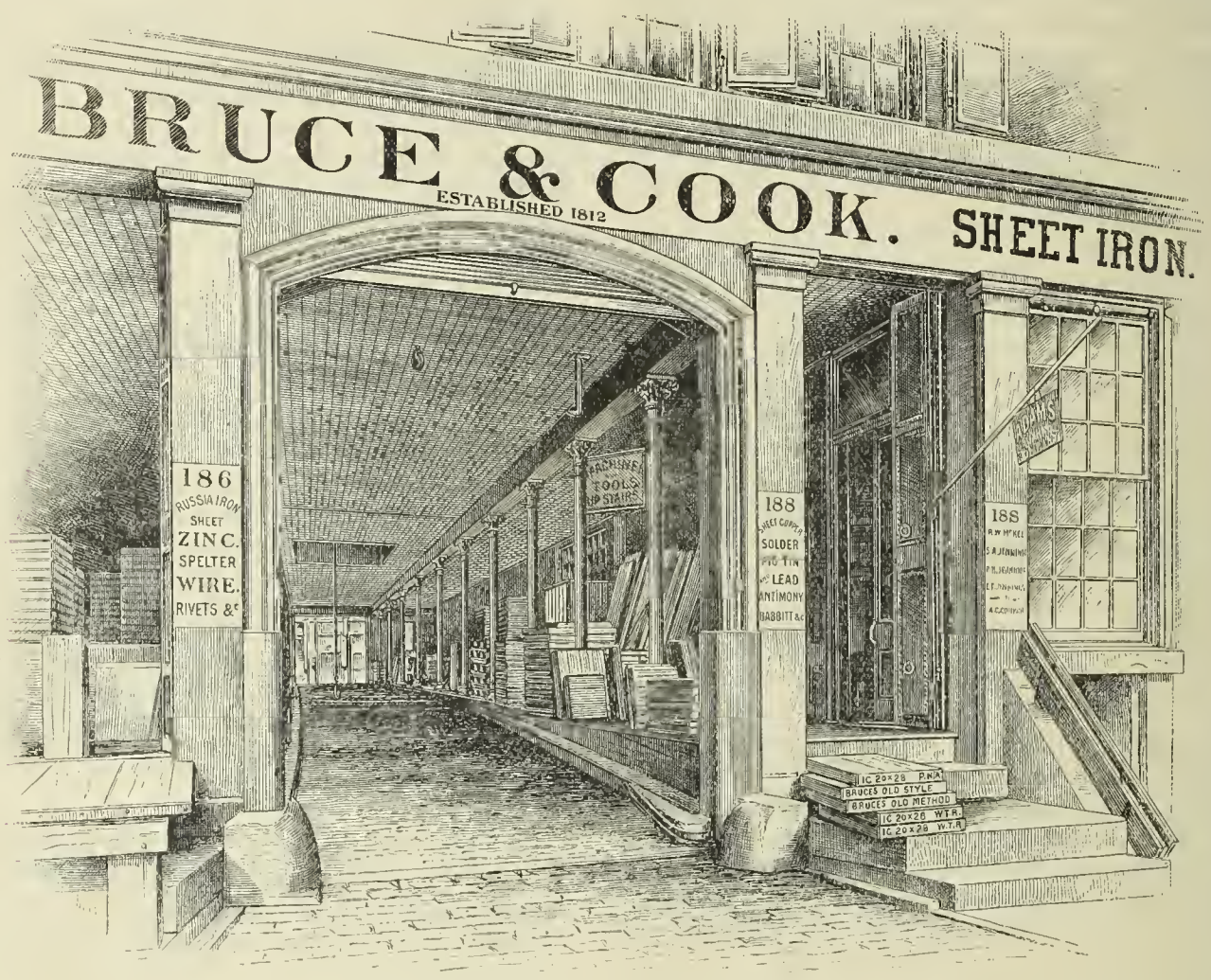
Answer.—The size of the opening between the mercury column and the gas is immaterial, for the pressure is entirely governed by the hight of the column of mercury and has nothing to do with the size of the opening. The statement made by the gas inspector, quoted by our correspondent, is correct. As a matter of fact, however, 1 pound pressure is eqnal to 2.035 inches of mercury, but in all practical work it is considered as equal to 2 inches of mercury.

Stove Repairing.

From H. A. H., Sherman, Texas.—I would suggest that the Letter Box can be used at this season of the year to good advantage for the discussion of the various wrinkles used by those who have had experience in repairing stoves of all kinds. At the present timo I am interested in cleaning gasoline and gas stoves. Another field is the cleaning of the japan or black enamel goods, such as gasoline stoves, fire grates and steel ranges. So far I have been unsuccessful in cleaning this portion of theso goods without leaving a greasy or smoky look.

A PIONEER METAL HOUSE.

The completion of their eighty-fifth year in business has been marked by the well-known metal firm of Bruce & Cook of New York City by the execution of extensive alterations and improvements in their business premises at 186 to 190 Water street and 248 and 250 Pearl street. Few, if any, concerns in the tin plate and metal trade are better known to the readers of *The Metal Worker* in all parts of the country than this old established house, which, in its remodeled condition, we illustrate and describe herewith. Before proceeding with an account of the buildings and their equipment, however, it will be interesting to glance at the history and development of a firm who for the long span of 85 years have, while ever growing, remained rooted in the same spot of soil in which the seed of their present flourishing business was first planted.



A Pioneer Metal House —Fig. 1.—The Driveway

FOUNDATION OF THE BUSINESS.

In the days when New York City proper occupied but a comparatively small area at the southern end of Manhattan Island, Water street justified its name as being the thoroughfare which skirted the water front of the East River, occupying a position which South street holds at the present day. It was then flanked by buildings on one side only. The lower part of these houses were usually occupied by stores, shops and ware houses which catered in a large measure to the wants of the vessels moored at the wharves at the other side of the street. It was at the present No. 190 Water street, between Fulton and John streets, that John M. Bruce, whose portrait we present, the founder of the business of Bruce & Cook, started, in 1812, the year of the last war with Great Britain, a small tinsmith's shop. His store was in the front part of the building, while his family, according to the custom of those times, lived in the rear and above. Mr. Bruce had long in his possession a copy of a newspaper published in 1760, containing a description of "a most spacious and imposing building of brick, 24 x 35 feet and three stories high, just completed by the English Copper Company, on the west side of Water street, near Fulton." The readers of the paper were advised to go and see this new structure, which "gave such evidence of the thrift and business development of the City of New York and of the country." It was this "imposing building" in which John M. Bruce, at the age of 21, began business, and which he subsequently bought. Its walls remain standing and it constitutes a part of the premises of the present concern. While illustrating their ideas of spacious and commodious accommodation in their large five story warehouse adjoining it, the reverence of the existing partners for the past was too great to allow them to demolish this relic. It is now used mainly for office purposes, and has been thoroughly refitted and rearranged, as to its interior, during the present year.

THE FOUNDER.

John M. Bruce commenced his business without other capital than energy, perseverance, integrity and a thorough knowledge of his trade, which he had begun to learn at the age of 11 years. From his father, a native of Glasgow, Scotland, he must have inherited the sterling qualities which have made Scotchmen the most successful pioneers and business men in all parts of the globe. He lost his parents, however, at an early age, and was thrown on the world when little more than a child, making his start in life, as he often said, with nothing but "an English shilling and his mother's Bible." Punctuality, enterprise, sobriety and scrupulously just dealing were among the characteristics which assured to the young tradesman the success he quickly achieved.

These qualities early gained for him the confidence and esteem of all with whom he came in contact, and his business grew apace. Soon after his start, it is recorded that one day, while Mr. Bruce was sweeping off his sidewalk, a prominent dealer in tin plate who saw him as he was passing along said to him:

"Mr. Bruce, I have watched your business growing and like your pluck and push, and I would like to sell you a load of tin" (which in that day was 12 boxes to a load).

"But," said Mr. Bruce, "I do not need so much, and will buy as I need the tin."

"Oh," said the dealer, "I will trust you for it."

The result was a sale, with Mr. Bruce's first note for 30 days. After the delivery of the goods Mr. Bruce figured out the exact amount it would be *per diem*, and laid aside that sum each day, so that when the note came due he had the cash to pay for it. An interesting relic of this period in the history of the business is still treasured by the successors of Mr. Bruce. It is in the shape of the pair of shears originally used by the founder of the firm. They are large wrought iron shears of English make, at least 100 years old.

John M. Bruce, Sr

AS AN IMPORTER.

A few years after his start in business John M. Bruce undertook a business trip to Europe. While there he made arrangements for the importation of foreign metal goods, to which branch of the business he subsequently devoted himself exclusively. This policy was continued during the earlier years of the house, and in course of time a very large business, done exclusively in imported goods, was built up. The reputation of the establishment for square dealing became very high, and Mr. Bruce took a pardonable pride therein. His sensitiveness in this respect was proverbial among his associates. One day a sea captain brought his wife into the store to select some cooking utensils. The lady was captious and inclined to disparage the goods shown to her by Mr. Bruce, despite his positive assurance of their good quality. After a time he quietly returned the pots and kettles to the shelf. The woman begged him to take them down again, as she needed them.

"Madam," said the merchant, "I shall sell you nothing. You doubted my word," and nothing would persuade him to relent.

John C. Cook

John M. Bruce, Jr.

Russell W. McKee.

Spencer A Jennings.

Philander R Jennings.

Frank C. Jennings

CHANGES IN THE FIRM.

In 1840 the oldest son of Mr. Bruce, on reaching his majority, was admitted into partnership under the name of John M. Bruce & Son. Subsequently James T. Bruce, the second son, became a partner in the concern, the style being then changed to John M. Bruce & Sons. In 1850 Mr. Bruce, Sr., retired from business. He died in 1872.

The house in 1850 became known as John M. Bruce's Sons. Franklin W. Bruce, the youngest son of the founder, was added to the partnership in 1852. On the retirement of his older brothers, in 1855, he associated with himself in partnership John C. Cook, who for a number of years had acted as bookkeeper to the concern, the firm name being changed to Bruce & Cook, a style which it has since retained. Subsequently Franklin W. Bruce retired from the business and his place was taken by John M. Bruce, majority, is attached to the house as a salesman on the road.

GROWTH OF THE ESTABLISHMENT.

Finding a pressing need for enlarged premises, to accommodate the requirements of his growing business, a five-story building at 186-188 Water street, adjoining the original structure occupied and purchased by Mr. Bruce, was erected by him about the year 1840. In 1863 further space was imperatively called for, and the property im

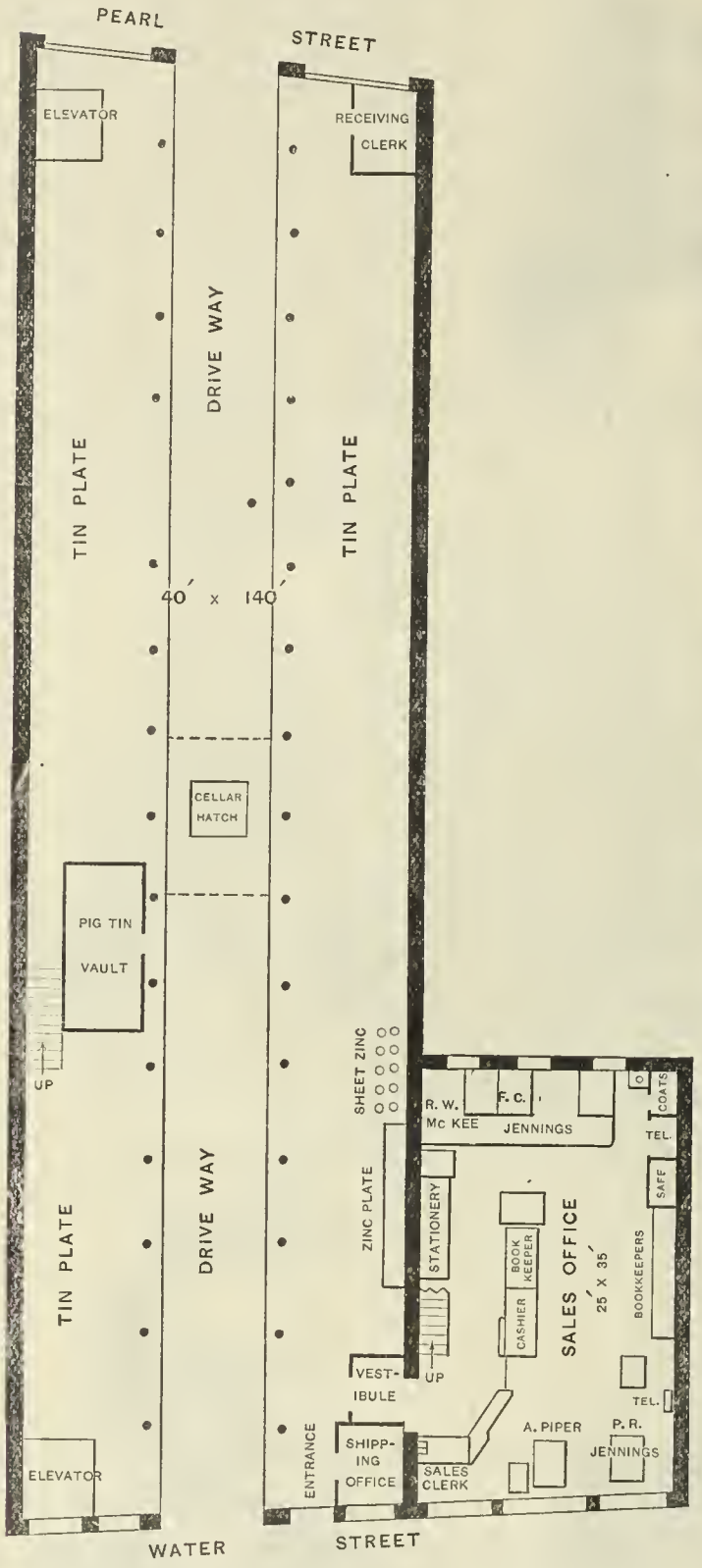


Fig. 2.—Plan of First Floor.

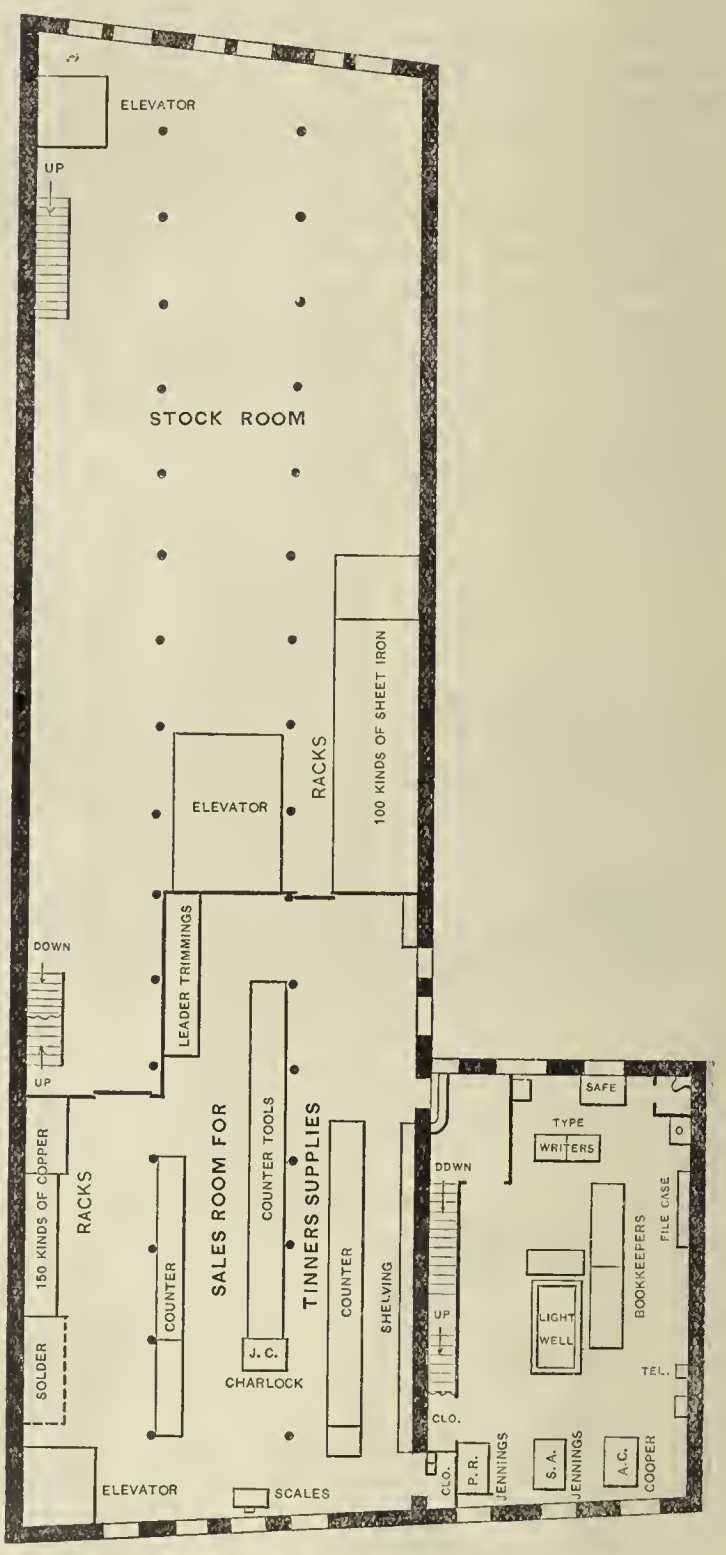


Fig. 3.—Plan of Second Floor.

Jr., who died in 1884. Mr. Cook died in 1892. Of the earlier members of the firm, the only survivor is Franklin W. Bruce, the third son of the founder, who for the past 25 years has made his residence in Paris, France. The present firm of Bruce & Cook are composed of Russell W. McKee, Spencer A. Jennings, Philander R. Jennings and Frank C. Jennings. Mr. McKee, the senior member, entered the service of the house in 1855, succeeding Mr. Cook as bookkeeper on the latter's advancement to a partnership. The Messrs. Jennings are nephews of the late John C. Cook. It is interesting to know that a John M. Bruce, of the fourth generation, who has just reached his mediately in the rear of this building, and facing on Pearl street, was acquired by the firm. Here they put up a similar six-story building, connecting with the Water street structure, thus forming a spacious single building 140 feet deep and 40 feet wide, extending clear through the block. The entire edifice is constructed in the most substantial manner. Its walls are 3 feet thick, with massive timbers and girders, each of the four upper floors being supported by numerous iron pillars. These floors rest upon a row of strong iron columns with solid masonry, making them absolutely free from vibration. The ground floor of 186-188 Water street is occupied by a

roomy driveway, flanked by shipping platforms extending the length through from street to street, as shown in Fig. 1. Thus a number of trucks can be loaded or unloaded at the same time nnder cover. The trucks enter at the Water street side and emerge on Pearl street. This arrangement conduces materially to convenience and rapidity in the shipment and delivery of goods.

THE OFFICE DEPARTMENT.

As has been seen, the present sales office of Brnce & Cook occupies the same grounnd and the same building in which the house was founded by John M. Bruce in 1812. What was then the cellar of the dwelling house was used for the storage of tin plate, and the front of the first floor was used for a sales department, while the back rooms and npper portion of the house were used for the family dwelling. The changes which have been made by the house in the celebration of their eighty fifth anniversary are shown in the illnstrations presented herewith. A plan of the first floor of the building occupied by the firm at the present time is given in Fig. 2, the original building being shown at the left of the plan. The main entrance to the building is at the right of the driveway on Water street. After passing the office of the shipping clerk, the vestibule is reached, which enters the sales office on the first floor, and in the corps employed and the eqnipment of the building, a special feature of the business of the house is brought to light. To many in the trade, the name Bruce & Cook is associated with large importations, and of late years' large shipments of home products. This branch of the bnsiness is taken care of in the wholesale department, shown at the right of the plan of the second floor in Fig. 3, where the attention necessary for the proper care of their larger trade is given.

A specialty has been made by the house of catering to the wants of the small buyer, whether he makes his appearance in the sales office or expresses his desires for goods and credit by correspondence. If he appears in person, the sales clerk at the entrance directs him or carries his card to the proper member of the firm. This trade receives the special attention of P. R. Jennings, whose desk is at the front of the building at the right, and he is assisted in this work by Angust Piper. A stenographer is located conveniently to receive their correspondence, and the telephone is at hand for communication with nearby and ont of town trade. The desk of the cashier and bookkee; ers occnpies the middle of the room, with the safe and stationery racks conveniently located.

At the rear of the building, the desks of the oldest and youngest members of the firm are located. The desk of Russell W. McKee is at the left, and conveniently near it is that of F. C. Jennings. A view in the sales office is given in Fig. 4, which will be familiar to many who have visited it and afford a pleasure to many who have long traded with the firm without a visit.

On the floor above, S. A. Jennings, whose desk is at the center and at the front of the building, devotes his attention to the wholesale trade. Associated with him is A. G. Cooper, whose desk is near at hand, and another desk is provided for P. R. Jennings, when his presence is desirable in the department for consultation. The view presented in Fig. 5 shows the arrangement of the wholesale office. This office is also equipped with file cabinets, typewriters, safes, and the necessary conveniences for handling the large business transacted in this department. On the floor immediately above, a private office is provided for use when it is necessary for the firm to hold a consultation.

Fig. 4 — View in Sales Office

SOLDER DEPARTMENT.

This part of the building is four stories high, and the top floor is occnpied by the solder making department. Here three furnaces are provided, with the necessary cooling tanks, storage racks and scales. Special attention is given to this department, and each member of the firm is interested in having the product turned out exactly as represented. The department is presided over by a snperintendent who has been in the employ of the house for 17 years. Solders of various grades are made, and each quality is dne to the proportions and different metals used in making them. Measnres are taken to prevent the possibility of a mistake in the mixtnre, and in the molds in which the different qualities are poured, so that the bnyer may know on picking up a bar of Bruce & Cook's solder just the quality it represents. When running full, this department has a capacity for turning out between 4000 and 5000 ponnds of solder per day. An elevator is provided for raising and lowering the materials for this department.

THE WAREHOUSE.

The first floor of the warehonse has a driveway leading through from Water to Pearl street, and near the center of the building, which is six stories high, is a special elevator for handling tin plates and heavy metals. This elevator operates through a well that is 10 x 14 feet in size. In the floor of the driveway is a hatchway which leads to the cellar or vanlt, in which a large

quantity of tin plate is stored. This building is 40 x 140 feet, erected on massive foundations and provided with a storage cellar so constructed and cemented as to insure dryness. Near the hatchway is a house, or vault building, for the storage of pig tin, and beside it is a stairway which leads to the upper floors. The left side of the building has an elevator at the front and another at the rear for handling stock. The space between is occupied by stacks of boxed tin plate. On the right, tin plate occupies a large space, but near the front a stock of zinc is carried, as shown in Fig. 2. This stock varies from 18 to 22 gauge, and the sheets can be furnished in different lengths and widths. Immediately at the rear of this stock of zinc plate is the stock of sheet zinc in rolls. At the Pearl street end of the building an office is provided for the receiving clerk.

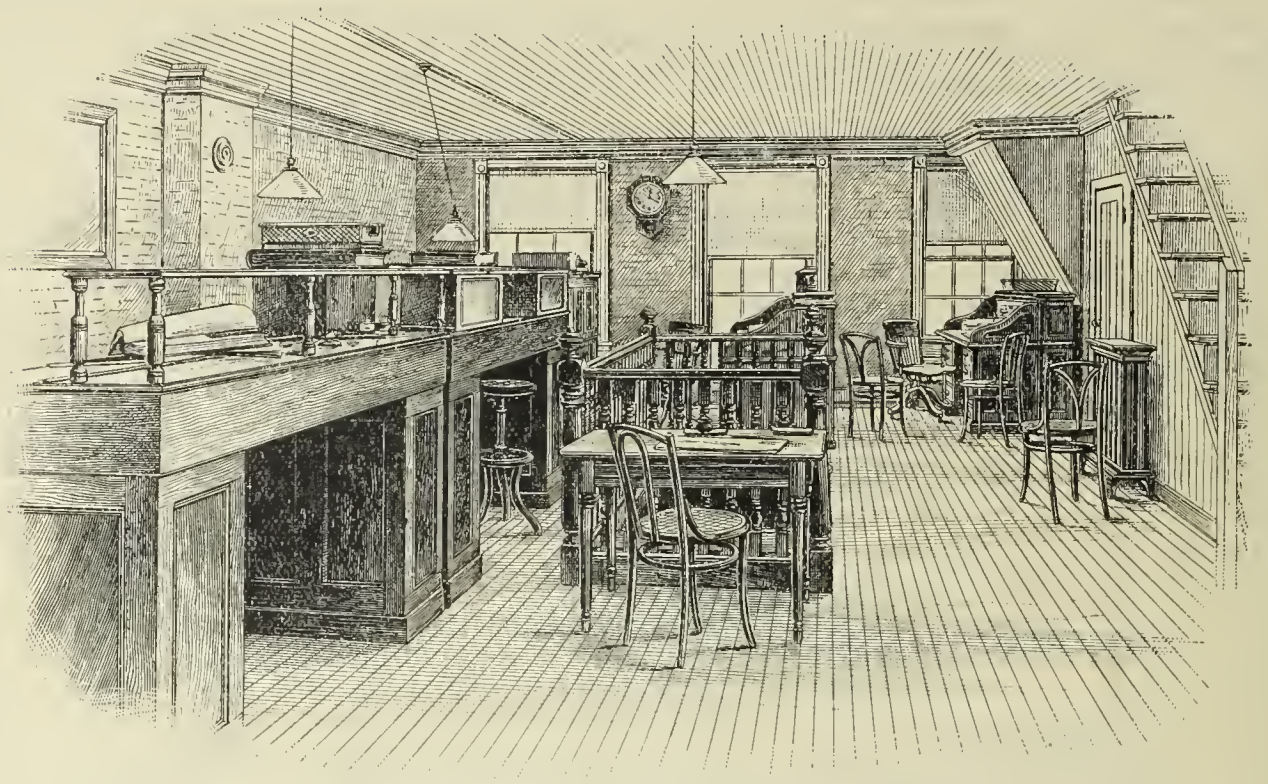


Fig. 5 — View in Wholesale Office

THE SALESROOM.

The second floor of the warehouse, shown in Fig. 3, is specially equipped for handling small trade and for carrying the smaller articles, which include an extensive line of tinners' supplies. This department is presided over by J. C. Charlock, a nephew of the founder of the house, who has been in the employ of the firm for 45 years, having begun service as an office boy, advancing to the position of shipping clerk, then serving as

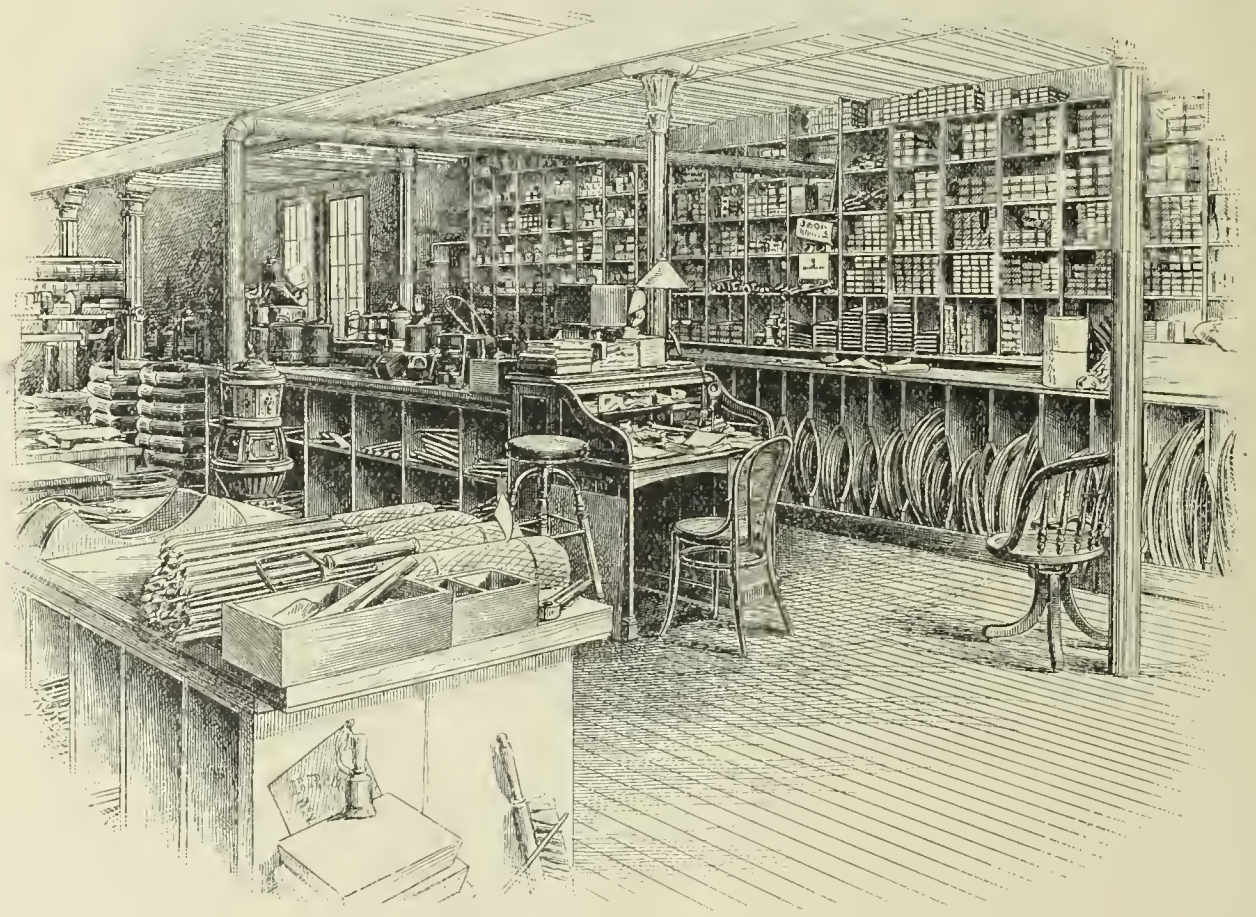


Fig. 6. — View in Retail Department

a traveling salesman on the road, and afterward being the city salesman for the house, and finally assuming charge of this important department.

On passing through the sales office and up the stairs to this department, the customer is in the midst of a large collection of such goods as he is continually using, and a view in this department is given in Fig. 6, which will be

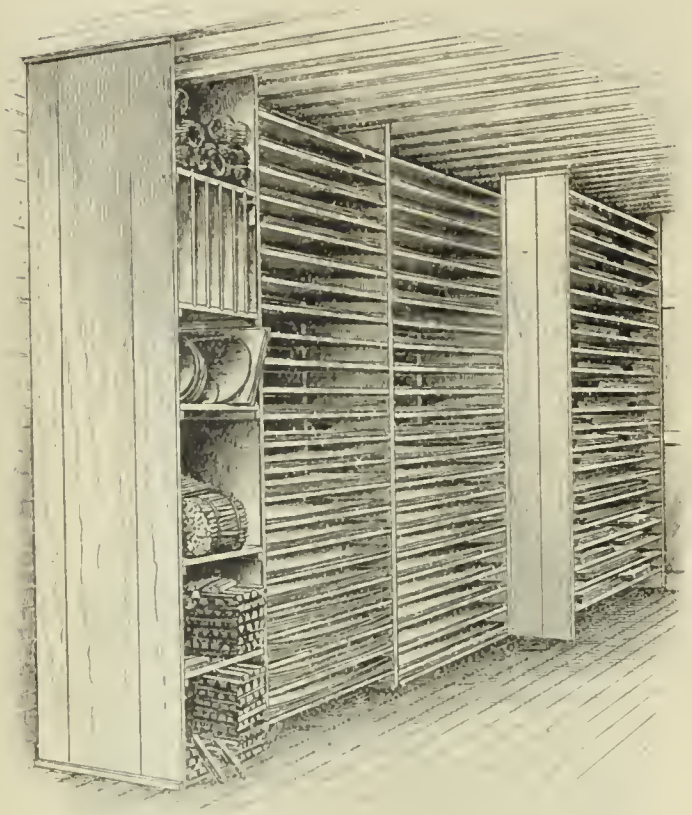


Fig. 7.—Rack for Sheet Copper.

familiar to the wives and daughters in the trade who include Bruce & Cook in their shopping list to secure some small supplies. The shelving along the right wall contains a line of plumbers' hand tools, as well as tinners' hand tools, and a complete line of various sizes of tinned and black rivets used by tinners. Here is also stored in convenient racks a large variety of sizes and qualities of tin plates, so that the purchaser may buy one or a dozen or more sheets, as his necessities require. Here likewise are found bucket ears, pump valves, brass, copper, tinned and black wire.

The counter immediately in front is arranged with bins underneath for the storage of wire of different sizes, plain, coppered and tinned. The center counter is provided with bins for soldering coppers and mallets, bucket handles and tinners' wooden ware. It also displays a variety of tinners' machines. In bins underneath are a complete line of roofing tools from the double seamers to be operated by the foot to the ½-inch and 10-inch tongs, with hand seamers and heavy mallets. This counter also contains a variety of gas, gasoline and charcoal and hard coal soldering furnaces. At the left is another counter with scales for weighing solder, and underneath the counter is solder for various purposes, in addition to that made in bars for the tinners, including solder in cakes for plumbers' use, made into three-cornered bars so that it may be cut by machines for canners' use, and wire solders for the use of electricians and others. At the left side of the building the floor space for a considerable distance is used for carrying a large stock of their various grades of solder. Racks above are provided for carrying a variety of conductor wire guards.

ONE HUNDRED AND FIFTY VARIETIES OF SHEET COPPER.

Just back of this the house have arranged racks on which they carry 150 varieties and sizes of plain and tinned, planished and corrugated sheet copper of different gauges and for different kinds of work. A specialty is made of this copper trade and sheets of many sizes are kept in stock. For the convenience of carrying a varied assortment of copper, the rack shown in Fig. 7 has been provided, and is the means of the house being able to fill orders of those who call or who send in their orders with a promptness that has been a benefit to all concerned. At the rear end of this salesroom bins are provided for leader and eave trough hooks and hangers, rain water cut offs, eave trough ends, spout heads and shoes, while the space near at hand is occupied by a variety of stove boards, stove pipe elbows, stove pipe dampers and other hardware specialties indispensable to the tinner.

THE STOCK ROOM.

In the rear is a large stock room, a special feature of which is a rack for carrying an assortment of sizes of sheet iron, which is shown in Fig. 8. These racks have a capacity for storing 100 different sizes and gauges of black and galvanized iron, enabling the house to fill an order for a sheet of iron of the special gauge and size where the buyer would have no use for a bundle of the material he needs. The balance of this floor is used as a general stock room. The third floor is covered with a stock of black and galvanized sheet iron. Racks are provided for the storage of metal lath, sheet iron siding, corrugated, galvanized and plain and painted Cycle roofing, known as continuous roofing tin in rolls. The fourth floor is occupied by a stock of annealed and unannealed tinned and black wire, conductor, eave trough, elbows, Russia iron in the original packages, and patent planished iron. The fifth and sixth floors are occupied by an electric motor

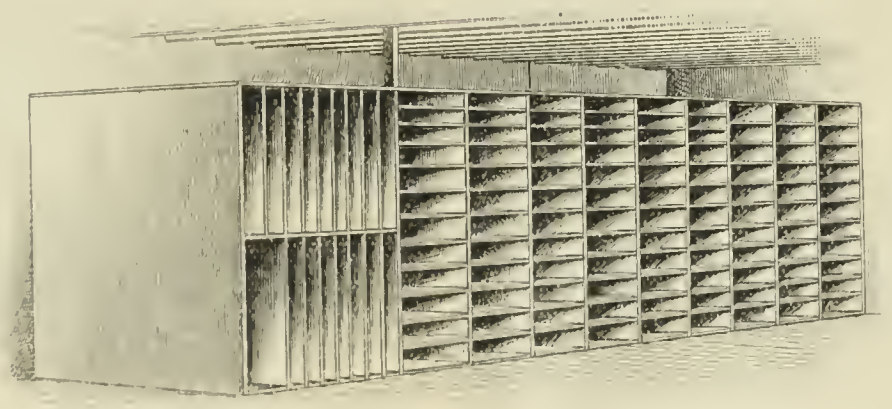


Fig 8.—Rack for Sheet Iron.

for operating the elevators, and a stock of metal shingles, rain water cut offs, and stove pipe elbows.

A SUBSTANTIAL BUILDING.

The big warehouse building was specially constructed for the heavy goods in it, the joists of the different floors being so close together in many instances that the use of flooring seems only for the purpose of preventing things from dropping through. These joists are supported by massive girders. The building possesses a floor space of 37,000 square feet, all of which is utilized not only for the best interests of the house, but also so that they can cater to the

wants of their customers to the best advantage. The two buildings are connected on each floor by archways provided with metal covered sliding doors as a protection against fire. Similar doors divide the various departments on each floor of the larger building. A notable feature of the establishment is the complete telephone system. The desks of the partners and their assistants, as well as those of the heads of departments, are each provided with a portable telephone, affording instant communication between the different parts of the building as well as with the city and long distance telephone systems. This arrangement is found most valuable as a time saver, obviating much delay and running up and down stairs by the clerks and employees generally.

APPRECIATIVE CUSTOMERS.

As we have shown, the history of this pioneer American metal house is practically coeval with the rise and development of New York City as the commercial metropolis of the United States. Very few metal firms in the country antedate it in age, and the growth of its business has kept pace, step by step, with the commercial growth of the city and the country at large. Beginning in the humblest way, the business of Bruce & Cook has extended with the lapse of time until to-day its ramifications reach to all parts of the United States. Besides doing a very large local business, the customers of the firm are to be found from Maine to Texas. Some of these have dealt steadily with Bruce & Cook for half a century or more. We have seen a letter (one of many of similar tenor in the possession of the firm) received recently from a tinner and sheet metal worker in Florida, who has been buying from them since 1848. In his letter, while paying a high tribute to the house, he makes the statement that in all that half century there had never been the smallest cause of complaint or misunderstanding in connection with any of his dealings with the firm.

Artistic Sheet Metal Work.

We have received from the Canton Steel Roofing Company, Canton, Ohio, a copy of their 1898 catalogue. It is a pamphlet of oblong shape measuring 12 x 9 inches, containing 64 pages and sumptuously illustrated. This concern are manufacturers of every kind of sheet metal goods, including copper, tin, galvanized, zinc and painted sheets. The first pages give rules for the metal ceiling business and the special features of the Canton Steel Roofing Company's ceilings, which they describe as "not the cheapest, but the best." Following this comes the illustrated portion of the catalogue, beginning with ceiling plates of continuous design, and centers, ceiling panels and border designs; then borders and miter plates, continuous plates, moldings, fillers and corner leaves, fillers and moldings, cornices, centers, closed and ventilating wainscoting, ceiling designs, side wall designs, panel ceiling designs, while a number of very elaborate and handsome styles are illustrated under the various combination designs. Sectional views showing constructive features follow; then come other illutsrations of cornices and stamped zinc ornaments, the latter covering 15 pages, with a number of illustrations to each page. Stamped siding and skylights complete the illustrated portion of the volume. The last two pages are devoted to a telegraphic code and a few testimonial letters and references, and the back cover carries an index.

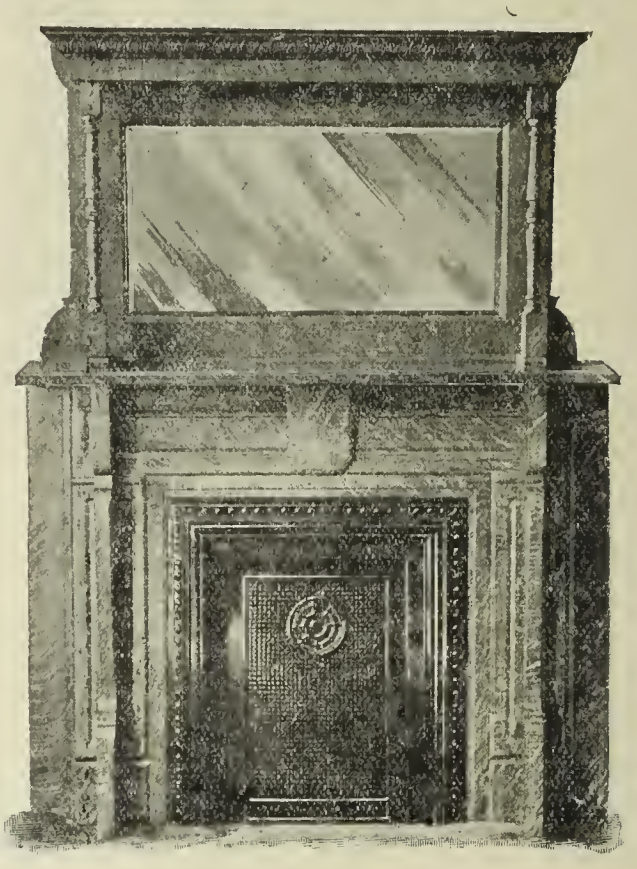
Senator Hale of Maine has introduced into Congress a bill providing for the construction of dry docks at Portsmouth, N. H.; Boston, Mass.; Algiers, La., and Mare Island, Cal., and for the enlargement of the Brooklyn, League Island and Norfolk docks, the appropriation for Portsmouth being $1,000,000; Boston, $1,350,000; Algiers, $500,000; Mare Island, $500,000; Brooklyn, $286,556; League Island, $286,556 and Norfolk, $160,000.

The New York Chamber of Commerce has sent to the Secretary of War a report on harbor defenses, in which such immediate action is asked for as will provide a force of trained artillerymen for the proper manning of the seacoast defenses of the country. It is suggested that 110 seacoast batteries, requiring an increase of about 4000 artillerymen, are necessary. Secretary Alger has sent the communication to Congress with his approval.

The sum of $200,000 has been appropriated by Congress for the purpose of getting supplies to the distressed miners on the Klondike.

Steel Mantels

The mantel of to-day with all its beauty is the outgrowth of the shelf above the fire place of olden times. Then it was without great pretensions of beauty in itself, but was a thing of utility primarily. In the modern house, however, the mantel is conspicuous for its beauty as a piece of house furniture as well as utility. Materials of various kinds have been used for the purpose. Woods of different kinds and finish, as well as slate, marble, onyx, &c., are employed. The newest material for his purpose is sheet metal. The Steel Mantel Company of 19 Vandewater street, New York City, are putting on the market a line of handsome mantels manufactured from this material. They have secured for the purpose of manufacturing these mantels large presses of great power, and have provided for use in them dies of various designs, so that the whole face of the mantel can be stamped



Steel Mantels.

up from one piece of steel. These mantels are arranged with openings so that stove pipe may be connected with a chimney behind them, and some are provided with openings for a hot air register. Being made of steel, they do not warp or crack and the settling of the building cannot break them. The company also have a special method of enameling their surfaces in imitation of various woods, and all colors of stone from dark slate to marble, and also elaborate patterns of onyx, the design and finish being adapted for all kinds of dwellings from handsome apartment houses to suburban cottages. The advantage of steel for this purpose is found in the durability and also in the low cost. The upper or cabinet portion of these mantels is made of natural wood finished with plate glass mirrors, and can be made as elaborate as is required by the building in which they are to be used. They are easily set up and can be delivered in all parts of the country in good condition.

The A. Fisher Mfg. Company, Hamilton, Ohio, have closed a contract for the enlargement of their present building by having another story placed on the top, and they will also add two additional three-story buildings to their plant. The improvements will give an addition of some 14,000 square feet of floor space.

The catalogue issued by the F. O. Smith Wire and Iron Works, Chicago, Ill., is a volume of 90 pages and presents a vast number of illustrations of the goods that this concern manufacture These include Fence Railings, Jail Work, Roof Crestings, Builders' Work, Stairs, Guards, Vases, Fences, &c. In addition to the illustrations and lists of sizes, prices, descriptive particulars are presented where necessary.

The latest large consolidation announced is that of the three largest cracker manufacturing companies in the United States. These concerns have an aggregated capital of $25,000,000, and the capitalization of the new combination is placed at $55,000,000.

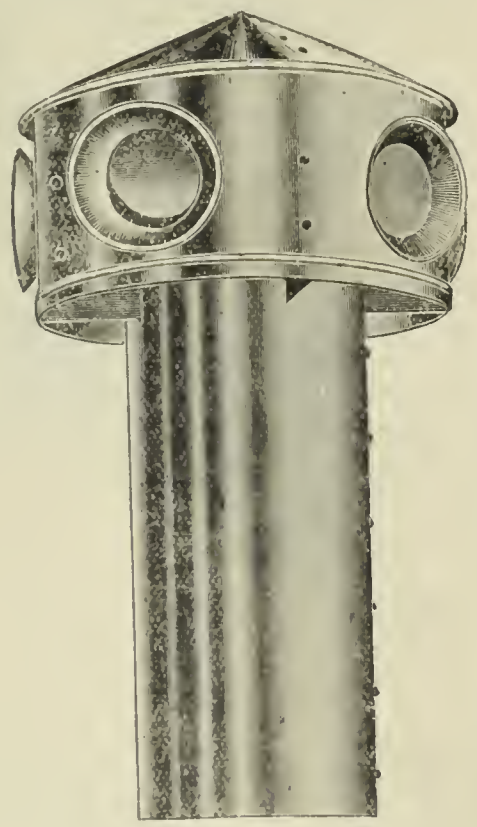
SHEET METAL WORK.

Meeting of Sheet Iron Manufacturers.

The Association of Iron and Steel Sheet Manufacturers, composed of black sheet makers, held a meeting in the Conestoga Building, Pittsburgh, on Tuesday, December 21. J. G. Battelle of Piqua, Ohio, was chairman. The present condition of the black sheet trade, together with the low prices prevailing, were gone over and fully discussed, and action was taken on some matters which it is believed will be of considerable benefit to the trade. Nothing special was done in the matter of prices beyond informal discussion. It was the sentiment of those present that in view of the higher prices for billets and sheet bars better prices for sheets should be obtained, but it was left to the discretion of each manufacturer as to how best to accomplish this. Some routine matters were disposed of and the meeting adjourned.

New Form of Chimney Top.

Charles Kuhnhold & Co., 221 Beaver avenue, Allegheny, Pa., are manufacturing a form of chimney top illustrated in the accompanying engraving. This top was



New Form of Chimney Top.

patented very recently, and has certain features which, it is claimed, make it particularly effective as an exhauster Over the flue pipe is an inverted deflecting frustum which throws the hot gases out at the side, while surrounding the top of the pipe as indicated in the engraving, is a band with circular holes in it, flat valves preventing the passage of the wind to the openings in the flue pipe. The arrangement is such that the wind closes these flat valves on one side of the chimney and at the same time opens them on the other side, so that the top will draw constantly in all weathers. These chimney tops are made in all sizes from 3 inches up.

The Wilmington Cornice Works, Charles H. Blaine, proprietor, Wilmington, Del., favor us with a copy of their 1898 calendar, which they distribute to the trade in the interests of their line of work. The greater part of the card carrying the calendar leaves is occupied with an engraving showing a beautiful valley scene in the Tyrol. Incidentally reference is made to Copper and Iron Cornices, Metallic Skylights, Metallic Ceilings and other sheet metal work done by this concern.

Eave Trough and Conductor Pipe.

The regular annual meeting of the United States Eave Trough and Conductor Pipe Association was held in the Seventh Avenue Hotel, Pittsburgh, on Tuesday, December 21. C. D. Clark of Peoria, Ill., was president and Alex. Glass of Wheeling Corrugating Company of Wheeling, secretary. The meeting was well attended, about 15 concerns being represented in person and a number of others by proxy and letter. The present condition of the eave trough and conductor pipe trades was thoroughly gone over, and it was the sense of the manufacturers present that some effort should be made to obtain more remunerative prices. For considerable time past eave trough and conductor pipe have been selling at prices which leave little or no profit, and for the coming year a determined effort will be made to secure better figures. As a step in this direction, the list price of 2-inch conductor pipe was advanced from 12 to 13 cents per foot, and on 4½-inch eave trough the list price was advanced from 17 to 18 cents. Other matters of considerable interest to the trade were discussed, but the above embraces the principal action taken. Officers were also elected as follows :

President, C. D Clark, Peoria, Ill.
Secretary, Alex. Glass, Wheeling, W. Va.
Treasurer, Edward Langenbach, Canton, Ohio.

These officers with the following were chosen as the Executive Board : C. B. Sills, Niles, Ohio ; J. H. Eller, Canton, Ohio and G. M. Verity, Cincinnati, Ohio.

FLASHINGS.

The Canton Steel Roofing Company, Canton, Ohio, invite the trade to save money by sending orders direct to them for Continuous Panel Ceilings, Skylights, Cornices, Plain, Corrugated, Crimped, Beaded and Stamped Roofing and Siding and other sheet metal work. All this announcement is presented on a card which they are sending to the trade.

An explosion occurred last week in the oil room of the Pennsylvania Metal Ceiling Company's factory, at Twenty-third and Hamilton streets, Philadelphia, owing to the placing of a lighted candle near a benzine tank. The fire which resulted did damage to the building and stock amounting to $5500, all of which is covered by insurance.

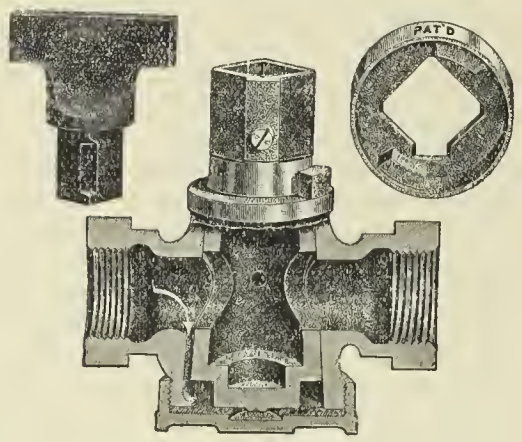
Marlin & Co., Incorporated, Twenty-fifth street and Liberty avenue, Pittsburgh, Pa., manufacturers of Eave Trough and Conductor Pipe, have received a contract from the Consolidated Traction Company of Pittsburgh for roofing and skylighting a number of buildings, including car barns and stables of that concern in Pittsburgh. The contract embraces the putting on of 3000 squares standing seam tin roofing, between 7000 and 8000 feet of skylights, several thousand feet of cornice and a large quantity of conductor pipe. Marlin & Co., Incorporated, are now at work on this large contract and have a considerable part of it already filled. It is the largest contract of this kind given out in Pittsburgh for a long time, and competition to secure it was very keen. The facilities of Marlin & Co. are such that they can take care of a large contract of this kind to very good advantage. They also have a number of other smaller jobs on hand and are running their new shops at the above location full time.

The firm of Berger Brothers, Philadelphia, Pa., manufacturers of Conductor Pipe and Gutters, Tinners' Hardware, Roofers' Supplies, &c., have been incorporated, and in the future will be called Berger Brothers Company, the directors being: President, W. H. Berger; secretary, William Barth, and treasurer, G. B. Geiser.

HEATING AND PLUMBING.

The H. M. Inverted Key Curb Cock.

In the H. M. inverted key curb cock, made by the H. Mueller Mfg. Company, Decatur, Ill., the manufacturers state that it has new and special advantages for this purpose. As shown in Fig. 1 the key of this cock is inverted, or, in other words, the large end of plug is at the bottom instead of at the top as in the ordinary cock.



The H M. Inverted Key Curb Cock.—Fig. 1.—Sectional View.

Owing to its construction in this manner there is no liability of its sticking, as a slight blow on key with wrench would tend to loosen the plug and permit of the key turning very easily. As shown in the sectional view the water enters the cock and passes through the by-pass under and around the key, thus forcing it gently upward so that there is no liability of leaking under the highest pressure that may be put on it. The most important feature of this cock is the H. M. patent cap, shown in Fig. 2, which

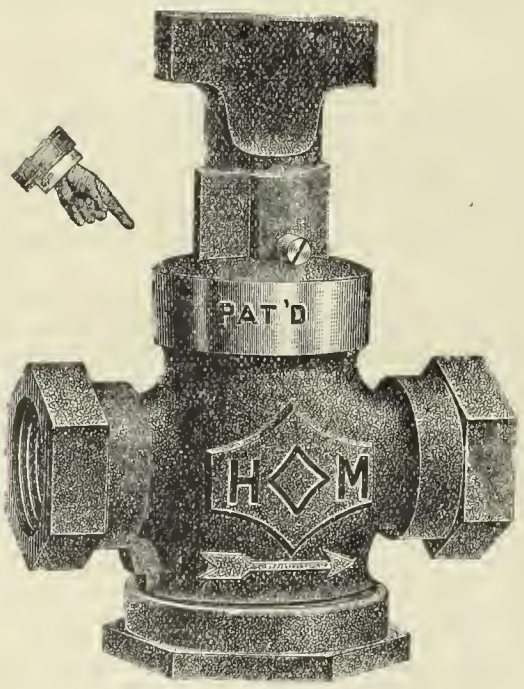
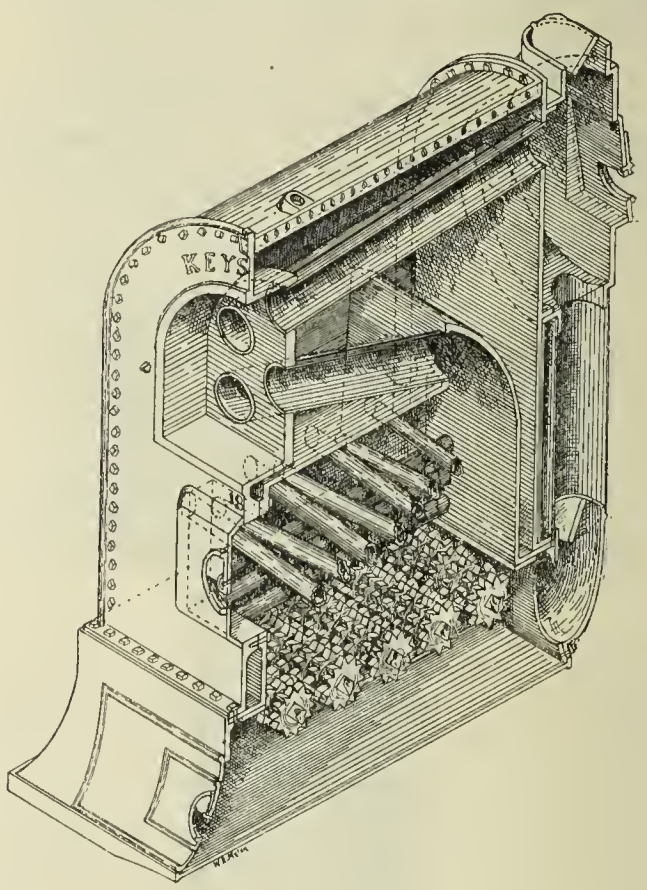


Fig. 2 —General View, Showing Sand Cap.

prevents the entrance of any dirt, sand or gritty material from working its way around the key, which otherwise might cause leakage after a very short time. This cap also performs another function—that is, the square of cap fitting square on key together with lug on body of cock forms a strong check, so that the operator always knows when cock is fully open or fully closed. These cocks, the manufacturers state, are made from red brass metal and guaranteed not to leak or stick. Any plumber or water works official wishing to investigate the merits of the cock is invited to write the manufacturers, who will take pleasure in giving full information.

The Keystone Boiler.

The special claim made for the Keystone boiler is its economical consumption of fuel. The boiler is the invention of Roy W. Jacobs, and is being manufactured by the Keystone Boiler Company, Huntingdon, Pa. A feature of the construction is the use of copper on account of its property of readily transmitting heat. A broken view of the boiler is presented herewith showing the construction, which consists of an outer water chamber through which hard rolled seamless copper tubes run to increase the heating surface. Three of these tubes are 1¼ inches in diameter and run lengthwise of the boiler in the fire chamber. Seven tubes of the same size run across the boiler just over the fire. The fire travel is through a number of 4-inch copper tubes, running through the lower tubes to the front of the boiler, where a rise is made to the return tubes above. All of the tubes are inclined to facilitate the oper-



The Keystone Boiler.

ation of the boiler. The grate consists of a series of cog wheels supported on square bars, giving strength and provided with ample space for the entrance of air to support combustion. The boiler is adapted for burning either coal or gas and can be furnished for either fuel. It is made for both steam and hot water heating in four sizes, with grates respectively 16 x 26, 17 x 27½, 18 x 28 and 20 x 36, and rated to carry 550, 700, 1075 and 1900 square feet of direct hot water radiation or 325, 500, 750 and 1350 square feet of direct steam radiation. The company have prepared for distribution a hanger showing different broken and sectional views of the boiler and a circular giving full dimensions and prices.

A Christmas souvenir that comes to us from Russell & Co., 89-91 Centre street, New York, through the courtesy of W. A. Russell, is a thing of beauty and, what is more to the purpose, of utility to those who are wise enough to make use of tobacco and delicate enough in their taste to appreciate tobacco in perfect condition. The gift, for it is more than a souvenir, is a cup of porcelain imitating alabaster handsomely mounted in brass. The cover is a compound affair and arranged most conveniently with a perforated top holding a blotter, which can be kept moist. When the winter comes with its excessive dryness, the smoker knows how much his happiness depends on having his tobacco carry the proper degree of moisture. We don't

want to say too much about this gift for fear that Russell & Co. will be overcowded with requests for samples, and we ought to add that they are only sending it to their good customers, and they have only a few dozen more left to send to those who order their Floor and Ceiling Plates.

NOTES.

Sturtevant & Hazeltine, Pittsfield, Maine, have just finished putting in the heating and ventilating plant at the new Harland Avenue School House. The system is the latest type of the Smith & Anthony Company. They also did the plumbing in the building.

The plumbing firm of West & Richardson, McKeesport, Pa., are putting in a hot water heating system in the residence of Prof. E. P. Murphey, at Port Vue.

We have received notice that the partnership lately subsisting between Fred. D. Johnson and Henry C. Adams, under the firm name of Fred. D. Johnson & Co. of 80 Centre street, New York City, was dissolved on December 15, 1897, by mutual consent. All debts owing to said partnership are to be paid to Henry C. Adams, who is made sole liquidating partner, at the office of Fred. D. Johnson, 80 Centre street, New York City, and all demands on the partnership are to be presented to Henry C. Adams. All the stock, fixtures, lease and contracts are henceforth vested in Fred. D. Johnson, who will continue the business.

The Minnesota State Board of Commissioners of Practical Plumbing have given notice that on January 5, 1898, they will meet at 10 a.m., at Duluth, Minn., to examine all applicants, as provided for by chapter 319 of the general laws of the State, approved April 23, 1897, entitled "An act to prevent incompetent persons from working as journeymen plumbers or conducting the business of plumbing in any town having a population of 10,000 inhabitants or more which has a system of sewer or waterworks in the State of Minnesota." Application blanks can be had at 230 West First street, Duluth, Minn. D. J. Harrington, secretary, St. Paul ; A. W. Scott, president, Minneapolis.

March R. Story & Sons, 121 Lake street, the Chicago agents of Russel Wheeler & Son, Utica, N. Y., have made the following sales in the past ten days of the Palace Queen and Palace Regent Furnaces: Four to P. A. George and four to Mrs. Eva Schermann, for apartment houses; two to W. L. Peterson, five to J. Trelease and one each to J. E. Edwards and Mrs. M. J. Sullivan.

The Buckingham-Routh Company, New Haven, Conn., report a considerable improvement in their line of business. Among contracts now on hand are the following : A Carton Furnace for Ritchie & Johnston's new house, the plumbing and heating of L. Leeds' five new cottages, a Volunteer Boiler for Mrs. Myrick's house, a Hornet Heater for W. H. Gage's house, the same for Miss Thompson's house, a Volunteer Boiler in George Butler's house and several others. The company have also recently finished the cornices and skylights for the new Pitkin blocks.

Ole Olson has opened a plumbing establishment at 117 North First street, Ishpeming, Mich.

H. H. Rice, for many years connected with the Turner Heater Company of Bristol, has taken office and showroom with the Wolcott & Parret Company, on Crown street, New Haven, Conn., where he will be glad to point ont to any one interested the merits of the Turner & Rice Heaters, which he represents. Mr. Rice has recently taken contracts to furnish Heaters for Mr. Thompson's new house, George D. Wharton's two-family house and a house in Hamden for Samuel Flight.

James R. Vance of the Vance Boiler Works, Geneva, N. Y., has recently been granted patents for a new boiler which will be called the Black Diamond.

We are in receipt of a four-page circular from E. M. Caswell, 9 Bowker street, Boston, Mass., relating to the Common Sense Drying Machine. The illustrations show a small engine connected with a blower which delivers the air into a chamber formed of sheet metal in which are placed steam coils. The drier is said to be adapted for use where moisture is to be removed and a perfectly dry atmosphere is required. Another illustration shows the machine used in connection with a lumber drying kiln, and a large portion of the circular is devoted to testimonial letters from those who are using the drier with satisfactory results.

At the annual meeting of the Whitlock Coil Pipe Company, held recently at the office of the company in Elmwood, Conn., the following Board of Directors was chosen: Ernest Cady, Samuel O. Prentice, Theodore M. Lincoln, Samuel Taylor, W. L. Shepard, Elmer G. Clark and John W. Crane. The directors elected the following officers : President, W. L. Shepard ; vice president, John W. Caner; secretary and treasurer, Henry R. Hovey. Messrs. Shepard and Crane have been president and treasurer respectively of the company for several years. Mr. Hovey was for several years with the Sullivan Machine Company of Claremont, N. H., and for nine years was head bookkeeper of the Farmers and Mechanics' National Bank in Hartford.

The Richmond Hot Water Radiator Company, Baltimore, Md., have been incorporated, with a capital stock of $15,000, divided into 150 shares of a par value of $100 each. The incorporators are Cornelius C. Hazlett, George H. Rogers, William C. Codd and Frederick S. Gassaway of Baltimore, and Robert W. Coffee of Richmond, Va.

The Stradling Plumbing & Heating Company of Utica, N. Y, have been awarded the contract for furnishing the plumbing, steam heating and sprinkler systems for the Oriskany Falls Knitting Mills.

The secretary of the American Society of Heating and Ventilating Engineers announces that the ballot for officers for 1898 has been forwarded to members, and he wishes to call attention to the fact that neglect to indorse the envelope with the name of the voter invalidates the vote. Any New York member who has so failed to indorse his vote can secure a new ballot and the return of his vote by writing to the secretary.

Fred. Wild & Co., El Paso, Texas, inform us that they have purchased the business of L. Gasser and are now prepared to do plumbing, tinning and metal work of all kinds. They will carry a fine line of Stoves.

Among the journeymen examined by the Milwaukee, Wis , Plumbers' Examining Board were many who could neither read nor write the English language, but they were asked the questions, examined orally and tried in practical work, the commissioners concluding that illiteracy did not bar out efficient workmanship.

Swinton & Co., Port Jervis, N. Y., have been awarded the contract for heating, with the Bundy system of hot water, the six large sanitarium buildings of the Sisters of St. Dominic, at Forestburg, N. Y. This is said to be the biggest contract of the kind ever taken by this firm, as 121 Radiators, 2 carloads of Pipe and 1½ tons of Steam, Globe and Check Valves will be used. The Valves are all of the Jenkins make. Five boilers will be used.

A. P. LaChapelle of West Medford, Mass., has sold his plumbing business to Palmer Brothers of Somerville.

The St. Joseph Pump & Mfg. Company, St. Joseph, Mo., publish a catalogue of the Perfection Water Elevator and Purifying Pumps of their manufacture. The various forms of these Pumps are illustrated and described and the details of their mechanism clearly explained. A number of testimonial letters speak in high terms of the excellence of these Pumps.

A price-list of the Kennedy Valve Mfg. Company is just issued from their general office at 75 John street, New York City. It is an oblong pamphlet of about 100 pages and gives illustrations, prices, descriptive particulars and all necessary information concerning the extensive line of Valves and Gates made by this concern. These Valves are for water, steam, gas, oil, ammonia, acids, &c., and include Globe, Angle, Check, Corner and Radiator constructions for high and low pressures.

A calendar that comes to us from the Folding Bath Tub Company, Marshall, Mich., manufacturers of Bathtubs and Store Fixtures, is a decorative sheet 15 x 20 inches in size, adorned at the top with a charming engraving and carrying at the bottom the 12 monthly calendar sheets. The background is tinted and the printing is in black and red.

The Crescent Brass & Iron Company have purchased the plant and assets from the Union Trust Company, receiver of the Crescent Brass and Iron Works, Detroit, Mich., and are continuing in the same line of manufactures, which consists of Lawn Sprinklers and Plumbers' Supplies. Their new catalogue devoted to these goods is ready, and they will be glad to send one of them on request.

The extensive establishment of Crook, Horner & Co., dealers in Plumbers' and Machinists' Supplies, at Howard and Saratoga streets, Baltimore, Md., was partially destroyed by fire on December 20, entailing a loss of about $150,000 to stock and building.

The Eastern manufacturing potters have dissolved their connection with the Western manufacturing potters, and the result may be that the operative potters will not get the 12½ per cent. advance in their wages promised at the joint meeting at Atlantic City last summer. The action was taken at a meeting in Philadelphia on Tuesday of this week in consequence of the Western manufacturers having failed to attend three conferences called for the purpose of effecting a settlement of the working prices of the operative potters of the country. The Eastern manufacturers are said to be willing to pay as high wages as those in the West, but as they have learned that

the English manufacturers have reduced their selling prices to meet the increased tariff duties imposed by the Dingley bill, they naturally feel reluctant to increase the cost of production at the present time. Negotiations have been entered into between the Trenton, N. J., potters and their workmen with the view of reaching a compromise and avoiding a strike.

Negotiations are still going on among the manufacturers of Sewer Pipe east of the Mississippi River looking to the formation of a combination and the establishment of a central selling agency. A meeting of the interests involved, which was held the week before last at Cleveland, Ohio, broke up without an agreement being reached, but it is reported that at a further meeting at Pittsburgh, Pa., on Monday last, the scheme was advanced so far that a final agreement is expected to be reached at the next meeting of the manufacturers, which will take place at Pittsburgh after the holidays.

H. Gilbert Hart of the Hart & Crouse Company, Utica, N. Y., was in New York this week visiting W. M. Mackay, 235 Water street, and W. M. Brownback, their Philadelphia representative, was also in the city.

Joseph E. Bond, president of the American Radiator Company, returned from Europe on last Saturday's steamer and was met by Clarence E. Woolley of the Chicago office and W. H. Hill, manager of the New York office.

Secretary Woods of the Fuller & Warren Company, Troy, N. Y., was a recent visitor among the heating trade in New York City.

Coyne & Delaney, manufacturers of Plumbers' Brass Goods and Specialties, are removing their establishment to 303 Rodney street, Brooklyn, N. Y., where they will have increased facilities for manufacturing their goods.

George P. Jacobs & Co. have moved their Steam Fitters' and Plumbers' Supply business to Broadway and Rodney street, Brooklyn, N. Y.

Wilson & Roarke, 261 Front street, New York, recently shipped one of their Sunbeam House Heating Steam Boilers to England. The specifications called for a boiler to be made of ⅜-inch sheet steel, as it was to carry a pressure of 30 pounds. The house make a specialty of Portable Vertical Tubular Boilers, and many of their Boilers in which the material is not so thick as mentioned are working under a pressure of over 100 pounds. The firm are now corresponding with a house in Italy with reference to the sale of some Steam Heating Boilers in that country.

Henry W. Avery, 367 Front street, New York, reports a good trade in the coppersmith business, having recently turned out some large Steam Jacketed Kettles, and also some Copper Stills. He makes a specialty of Copper Work for Ships and also does Ship Plumbing and Steam Fitting.

The Richmond Stove Company, Norwich, Conn., inform us that the popularity of the Richmond line of Heating Apparatus still continues, and from a list of contractors who are using these goods we find that C. B. Jackman & Son, Nashua, N. H., are using two No. 924 Richmond Furnaces in a large apartment house: John L. Congdon, East Greenwich, R. I., is using a Richmond Hot Water Boiler in the residence of Mrs. Edward Taylor, and J. Callaghan & Son, Cleveland, Ohio, are using a Richmond Hot Air Furnace in the residence of J. E. Gillin. The list covers a wide territory and includes Steam Heaters, Hot Water Boilers and Hot Air Furnaces.

The Metal Worker acknowledges the courtesy of an invitation to attend the eighth annual ball of the Enterprise Association of Steam Fitters, held in the Lexington Avenue Opera House on Wednesday, December 22. The invitation is signed by the secretary, J. F. Brown, and T. A. Simpson, the chairman of the Committee of Arrangements.

The Association of the Master Plumbers of the City of New York issue from their quarters, 155 East Fifty-eighth street, a notice that their ninth annual entertainment and reception will be held at the Central Opera House, Sixty-seventh street and Third avenue, on Thursday, January 13, 1898. Tickets can be procured from A. H. Brown, 1777 Broadway. The committee having the entertainment in charge is composed of T. J. Tuomey, chairman; J. W. O'Brien, J W. Cooney, T. J. McCormack, B. F. Donahue, T. F. Gaynor, A. H. Brown and H. J. Pattison.

We have received from A. Weiskittel & Son, proprietors of the Maryland Foundry Company, Baltimore, Md., a price-list of their Porcelain Enameled Bathtubs, printed in two colors. On the other side of the price-list a picture of a modern narrow roll rim Bathtub is shown on a marble slab, with tile flooring and side walls. The house have been making Cast Iron Bathtubs for some time, and are now furnishing what they claim to be the finest grade of Porcelain Enameled Baths.

Edward A. Hoops of Moylan, Pa., is installing a Gurney Hot Water Heating System in the residence of Mrs. Susan Sharpless.

Joseph Ahearn of San Francisco, Cal., is doing the plumbing in the Sacred Heart Convent, at Menlo Park, Cal.

The State Executive Committee of Master Plumbers of New Jersey met in Paterson on December 17 to receive the six master plumbers who are Assemblymen-elect from Essex and Hudson counties, with a view to discussing the proposed plumbing law and to take measures for its enactment.

President Culloton of the National Association of Master Plumbers announces from the headquarters, the Revere House, Chicago, the appointment of James E. Phillips, 1421 East Main street, Richmond, Va., as State vice-president for Virginia, and of P. S. Cook, Cheyenne, Wyo., as State vice-president for Wyoming.

The wedding of W. E. Crosby, the popular and efficient clerk of the National Association of Master Plumbers, and Miss Mary C. Johnson of Detroit is announced for December 28. We join with the many friends of Mr. Crosby in congratulating him and wishing him all happiness.

George W. Stewart is about erecting for S. Faith & Co., plumbers and heating contractors of Philadelphia, Pa., a three-story and basement building in the Italian renaissance style of architecture, having dark mottled brick facing with terra cotta and stone trimmings, large plate glass windows, &c. The frontage on Pennsylvania avenue will be 78 feet and on Taylor street 42 feet. The basement will be used for Pipe Work and the storage of Fittings, &c.; the first floor for offices, drafting rooms, showrooms, &c., and the second and third floors for Sheet Metal Work. The work will be commenced at once and is expected to be finished in about three months.

The Lunkenheimer Company, Cincinnati, New York and London, England, have been making preparations for a large shipment of valves and machine fittings to South Africa that will aggregate 26,000 pounds. This is a large shipment of this class of goods, and will be sent forward in a week or so. A consignment has just been made of 4000 pounds of brass fittings to Sweden by the company. The concern have been running full time, 56 hours a week, with 250 men, right along, which is up to the best of the past five years. Considering the improvement in the machinery that is used, by which no increase in the force is made necessary, this is better than has been done in years.

Pardee Hall, the fine four-story stone building presented to the scientific department of Lafayette College, Easton, Pa., by the late Ario Pardee, at a cost of $300,000, was almost entirely destroyed by fire on the morning of December 18. The center of the structure and the entire west wing were gutted and much valuable machinery, together with mineral and natural history specimens of great value, were consumed. The museum and the departments of mining and mechanical engineering and of geology were in the portions of the building wiped out by the flames. Among the sufferers by the fire was J. Madison Porter, professor of civil engineering, who lost all his machinery, instruments, papers, &c., valued at $15,000 and uninsured. The fine Ward Library, containing 10,000 volumes, was also destroyed. The total loss is placed at over $100,000. This is the second serious fire that has visited Pardee Hall since its opening in 1873. The first occurred in 1879 and practically destroyed the whole structure, which was immediately rebuilt and was reopened in 1880.

Official statements of the production of anthracite coal in November, 1897, show an output of 4,538,400 tons, as compared with 4,435,700 tons in November, 1896, and 5,012,700 tons in November, 1895. The total production for 11 months of the current year is about 37,900,000 tons, or nearly 2,000,000 tons less than in the corresponding period of 1896.

A profit sharing plan on a large scale has been inaugurated this week by the largest department store in Boston. The firm, under the new scheme, allow their employees 1 per cent. of their individual sales, in addition to their regular salaries. By this means they expect to give them an additional incentive to make sales and to work in the interests of the firm.

A dispatch from the City of Mexico announces the sale of the Inguaran copper mines of Mexico to Rothschild & Mirrabeaud of Paris, for several millions of dollars. Rothschild & Mirrabeaud, it is reported, will build two lines of railroad, one to connect with the western branch of the Mexican National Railway and the other with the west coast, so as to have connection with the Pacific Ocean.

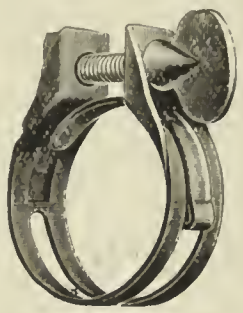
THE RETAIL STORE.

Protective Stove Dealers' Association.

The retail stove dealers of St. Louis, Mo., recently formed an association the object of which is to combat the growing competition of the large department stores. It is said that there are 150 retail dealers in the city, and that while more than 60 have already been enrolled the others are expected to join within a very short time. The organization is known as the Master Protective Stove Dealers' Association, of which G. A. Pauley is president, M. Kosch secretary and H. Kratz treasurer. A member of the association in speaking of the matter is reported to have said: "We intend to fight the department stores to a finish. The inroads that they have made in our business would astonish you. I know of several stove dealers who have been practically forced out of business on account of the department store competition. They can afford to undersell us, as they retail goods at low prices merely as an advertisement to their other business. We shall demand of the wholesale dealers as soon as our organization is sufficiently strong that they discontinue the sale of stoves to any dry goods establishment."

A Detachable Hose Clamp.

The H. B. Sherman Mfg. Company, Battle Creek, Mich., have recently added to their line of hose fixtures a brass clamp with a brass thumb screw and nut, as shown herewith. A clamp of this nature is especially desirable for use on connections to beer pumps, &c., where the connections may require frequent changing. If wire is used the tubing cannot be changed from its connection without considerable trouble, and the wire also cuts into the tubing, and not only weakens the tube but frequently causes leaks. This clamp, it is pointed out, can be tightened up in case there should be leakage. No tools are required either in applying or removing from the hose or tube, and there is nothing to rust, as all parts are of brass. It is



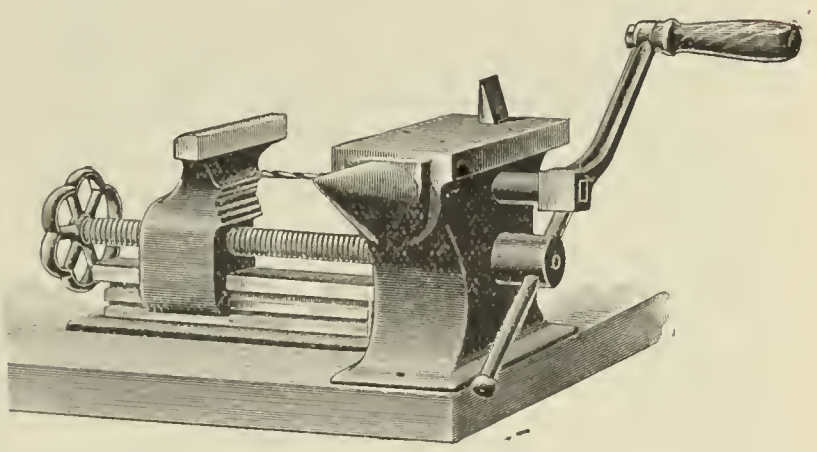
A Detachable Hose Clamp.

furnished in the ⅜-inch size, three different sizes for ½-inch tube and three different sizes for ¾-inch tube. The manufacturers will send sample of any size on receipt of 6 cents in postage.

Manager B. C. Bakewell of the metal department of Reymond & Gottlob, who are agents in New York for the Pittsburgh Reduction Company, reports an excellent local demand for aluminum. New fields for the metal are opening out constantly, and he finds the demand increasing in many quarters in which aluminum has been used more or less as a substitute for brass or other metals. The recent radical reduction in the price of sheet aluminum seems to have stimulated its use to a marked extent. This is particularly the case in the manufacture of signs, for which a steadily growing demand has been experienced of late. Mr. Bakewell is located in the same offices formerly occupied by the Pittsburgh Reduction Company, at 10 and 11 Havemeyer Building, New York City, of which Reymond & Gottlob took possession on November 1. The firm carry a very large stock of Aluminum in all its forms, such as Ingot, Sheet, Plate, Bars, Rods, Wire, &c., and are prepared to fill orders for the metal to any amount at regular factory prices. Reymond & Gottlob also carry a large line of Aluminum Household Utensils and Novelties at their down town store, as well as at their headquarters, 831 Broadway.

The Gipsy Combination Anvil, Vise and Drilling Machine.

The accompanying engraving shows a combination anvil, vise and drilling machine, which the Bonney Vise & Tool Works, 3015 Chestnut street, Philadelphia, are



The Gipsy Combination Anvil, Vise and Drilling Machine.

putting on the market. The tool is constructed of cast iron, with a steel vise screw, and is intended principally for the use of farmers. The anvil is 7 inches high, 12 inches long, with a 4 inch face. The vise jaw is 5½ inches wide and opens out 8 inches. Beneath the vise jaw and anvil faces are other gripping faces for holding pipe. The drill spindle is made for square shank drills, and may be slipped out of its bearings and put aside when the tool is not required for drilling purposes. When the tool is used as a drilling machine the vise handle bar is easily removed. The makers state that the tool weighs 40 pounds and is made for long service.

MEMORANDA.

The Haish Mfg. Company, De Kalb, Ill., publish an oblong circular illustrating many varieties of their Woven Wire Fences. Reference is also made to barb wire and descriptions of the various lines of Fences are given.

The catalogue and price list of the Never Break wares, manufactured by the Avery Stamping Company, Cleveland, Ohio, is being distributed to the trade. It is a small oblong publication of 50 pages, presenting a very handsome assortment of this well-known line of Wrought Steel Cooking Utensils. Illustrations are presented of the various goods, together with tables of sizes and capacities, and in many cases brief particulars are given of the merits of the wares. There are also many other articles noticed in the catalogue, including Snow Shovels, Fence Posts, Cattle Troughs, &c.

An extensive assortment of Nickel Plated Tea and Range Kettles, Coffee Pots, &c., are illustrated and described in a series of circulars distributed by the Rome Mfg. Company, Rome, N. Y.

The new building of the Canfield Stove Company, located on Spring street, Kingston, N. Y., is described in a recent issue of the Kingston *Daily Express* as being a structure 40 x 90 feet in size and two stories and basement in hight. The sides of the structure are covered with sheet steel stamped to imitate brick work, while the cornice and front are of galvanized iron, thus giving the appearance of a brick building with blue stone trimmings. Inside it is so arranged that a team can be driven the whole length on one side and heavy goods transferred to the basement and first floor, the floor being level with the top of the truck. A freight elevator is used to convey goods to the second floor. Everything is arranged with the idea of making it as convenient as possible and facilitating the handling of goods. The stock is arranged with a great deal of care and the Stoves, Ranges, Furnaces, Steam Heaters, Radiators, Plumbers' Supplies and other goods are so disposed as to fully meet the requirements of a successful wholesale and retail Stove, Plumbing, Heating and Sheet Metal business.

TIN PLATES.

New Castle, Pa., Tin Plate Works Not to Combine.

The projected consolidation of tin plate manufacturing interests at New Castle, Pa., is not to be carried out after all, so far as one of the largest concerns mentioned as a party to the deal are concerned. We are officially advised by the New Castle Steel & Tin Plate Company that the statement that they are to be consolidated with the new Shenango Tin Plate Company of New Castle is incorrect. Their works, we are informed, will continue in independent operation under the same management as heretofore, and they will manufacture the same well-known brands of the New Castle Steel & Tin Plate Company which have been on the market for the past four years. The news will be reassuring to many in the tin plate trade who have regarded the prospect of such a great consolidation as was contemplated with considerable apprehension.

American Base Box.

Following up their suggestion made earlier in the year for the adoption of an American system of Tin Plate classification and boxing to supersede the English method hitherto used, the American Tin Plate Company have sent out to all Tin Plate manufacturers, jobbers and large consumers the following circular letter from their sales office in Chicago, under date of December 20, 1897 :

"On and after January 1, 1898, all quotations made by us on Tin Plate will be based on the American base box and American package. Under separate cover we send you, with our compliments, a copy of the American Ratio and Code Book. You will find that the American base box and packages are arranged on the decimal system, making it much easier to compute prices, weights and quantities than on the English system. You will also find a great conveinence in the American system in describing all gauges by the base weight, doing away entirely with IC, ICL, IXL, IX, DX, &c., No. 38 Gauge, No. 37 Gauge, &c. We ask your kind support in adopting this system.

"A copy of the American Ratio and Code Book has been mailed to all Tin Plate manufacturers, jobbers and consumers, so that the code can be used generally."

We are advised that the company have been led to take this step after personal interviews with the largest class of buyers and consumers of the country, whom they found in favor of the proposed change and whose support they are promised in carrying out the plan. A number of the largest dealers, too, have said that they will put the new system into effect, provided the company get up a ratio book. This has been done and the system is now to be definitely initiated.

In line with the new departure, the American Tin Plate Company have issued a new quotation sheet (E), in which the base price of their Plates is based on 32,000 square inches and 110 sheets to the box. The standard base weights given are 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 160, 180, 200, 220, 240, 260 and 280 pounds to the box and the price of each description is arranged in a fixed ratio to the base price. Provision is made for wasters, extras, &c., on a stated basis. The American base box as established by the company is described as containing exactly 2 per cent. more square inches than the English base box, IC, 14 x 20, 108 sheets.

The November shipments of Tin and Terne Plates from Great Britain to the United States amounted, according to the British Board of Trade returns, to 5570 tons, an increase of 500 tons over the October figures, and a decrease of 300 tons as compared with November, 1896. For the 11 months ended November 30, 1897, the Tin Plate exports from British ports to this country reached a total of 75,352 tons, as compared with 105,972 tons in the corresponding period of last year.

SCRAP.

The Tin Plate and Can works of Norton Brothers, at Maywood, Ill., are among the largest of their kind in the world. The Tin Plate department, which contains 18 tinning sets, has a capacity of 10,000 boxes, 14 x 20, a week, and the Can making factory is capable of turning out 550,000 Cans a day. The Tin Plate manufacturing building is 264 x 106 feet, the Fruit Can factory 240 x 110 feet, the general factory 250 x 275 feet and the rolling mill and foundry 300 x 40 feet. There is also a warehouse, 200 x 125 feet, capable of storing no less than 15,000,000 Cans. The buildings are connected with one another and with the railroad by a mile of pivate side tracks.

Jacob Graff, manager and principal owner of the Blairsville Rolling Mill & Tin Plate Works, Blairsville, Pa., died suddenly on December 15, at Blairsville, from a stroke of apoplexy. He was 60 years of age and was identified with many business interests of the town. He is survived by a widow and one child.

The Pennsylvania Tin Plate Company, New Kensington, Pa., expect to have their additional capacity of two hot mills and two new stands of cold rolls, together with new tinning machinery, in operation about January 1. This will give the company a six-mill plant.

The changes in the plant of the Monongahela Tin Plate Company, Pittsburgh, Pa., will include, besides an increase of five new mills, a complete remodeling of the hot mill department and the rearranging of the cold rolling department to the tandem system.

The Reading Tin Plate Works, Reading, Pa., are kept busy on orders for early delivery. They are turning out about 400 boxes of finished Plates a week.

Activity is the order of the day with the American Tin Plate Company, who are operating 26 mills and 51 tinning sets at their works at Elwood and Montpelier, Ind. Every department of both plants is reported to be constantly busy.

E. H. Stroud & Co., 511 Northern Office Building, Chicago, metal factors, have recently opened an office for the convenience of their Eastern customers at Room 502, Woodbridge Building, 100 William street, New York. Stroud & Co. sell the entire product of certain manufacturers of Iron and Steel in the Pittsburgh district, and also represent several Ohio mills manufacturing Sheet Iron, Black Plate, Tin Plate, &c. They also do a large business in Brass and manufactured Copper, and in pig metals, such as Spelter, Lead, Ingot Copper, &c. With the exception of manufactured Brass and Copper they do not sell less than a carload lot.

The existing depression in the Welsh Tin Plate industry was emphasized at a recent public sale of shares of the Park Tin Plate Company of Clydach. The bidding was slow and the price eventually realized was $650 for each $1250 fully paid up share, a depreciation of 48 per cent.

We are in receipt of a neat folder, printed in red and brown, just issued by the Phillips Tin Plate Company, Incorporated, 1019 Susquehanna avenue, Philadelphia, which calls attention to their well-known brands of Tin and Terne Plate. These include three brands of Bright Charcoal, one brand of Coke and seven of Roofing Tin. Attention is also called to the company's high grade Terne Plate, put up in rolls, ready locked, soldered and painted for laying on the roof. The firm advise us that they have a good established trade and are experiencing a very gratifying demand for their product, many of their customers dating back since 1892.

A recent report of the Commissioner of Lands and Mines of Perak, a State on the Malay Peninsula, under British control, places the output of Pig Tin from that district in 1896 at 22,754 tons, which is less by 1052 tons than the corresponding figures for 1895. The production last year was diminished by the lower price of the metal and by unusually heavy rains. The value of the ore ex-

ported in 1896 was $12,339,877, being $1,713,630 less than the value of the 1895 exports. The territory devoted to Tin mining in Perak at the close of 1896 was 67,553 acres. The report notes that a fall of 15 per cent. in the price of Tin in two years has been accompanied by a fall in production of 3 per cent. only.

The six new Black Plate mills of the La Belle Iron Works, Wheeling, W. Va., are nearly completed and will be started up soon after January 1. This addition will increase the Tin Plate capacity of the concern to a ten-mill plant. Six new tinning sets have also been added, making 14 in all.

The new Tin Plate plant of the Cincinnati Rolling Mill & Tin Plate Company, Cincinnati, Ohio, at Riverside, is reported in active operation with three Black Plate mills and five tinning sets. A fourth Tin mill is building.

After running successfully for some five years, Gummey, McFarland & Co., Philadelphia, have closed down their Continental Tin Plate Works for good and disposed of the tinning machinery, &c. The firm do not propose to coat any more plates, having made satisfactory arrangements with a large mill to manufacture for them their well-known special brands of Tin and Terne Plates.

The six-mill plant of the Beaver Tin Plate Company, Lisbon, Ohio, is running full in all departments. The concern are making a new brand of Terne Plate, which they designate Beaver Extra.

The Baltimore Tin Plate Company, Locust Point, Baltimore, Md., are operating two out of their four hot mills and three tinning sets, and are turning out Bright Charcoal and Coke Plates and Terne Plates, all under the brand name of Baltimore.

John L. Nash of the well-known Tin Plate firm of Henry Nash & Co., Liverpool, England, arrived in New York on Wednesday by the steamer "Majestic," on a short business trip. Mr. Nash is spending the holidays with his brother, H. V. B. Nash of T. B. Coddington & Co., New York.

A Novel Mountain Railway.

A mountain railway, constructed on a novel plan, is shortly to be opened for traffic on the Hochstauffen, near Bad Reichenhall, Bavaria. The chief feature of the new system, says the London *Times*, is that the force of traction is directed vertically upward, being derived from a balloon. The latter has a diameter of 66 feet and a lifting power of 10,560 pounds. The balloon, car, net, ropes, &c., weigh 4620 pounds, and an allowance of 3300 pounds is made for passengers and aeronauts, leaving a margin of 2640 pounds. A single rail is used for the sole purpose of directing the course of the train and keeping the balloon with its load captive. To this end the rail is made T-shaped, and the car runs on it, gripping it from the sides and from below. The rail is anchored to the ground at distances of about 15 feet. In descending the mountain the propelling force is gravity, and the balloon acts as a check to prevent accelerated motion. A ballast of water, taken in at the top of the mountain, provides the additional downward force required. The truck carries the water receptacle, which can be opened by the aeronauts during the journey. The truck and receptacle together weigh about 600 pounds, and when there is no wind the receptacle carries about 1100 pounds of water, making a total weight of 1760 pounds. When it is windy the strain between the balloon and the truck is reduced by letting the water out of the receptacle, thus compensating for the difference in power. The difference in weight caused by passengers entering or leaving the car is regulated by the use of separate weights, a sufficient number of which will be kept at the several stations.

TRADE NOTES.

Columbia Nickeling & Enameling Works have been incorporated in New York City, with a capital stock of $3000. The directors are James D. Wicks, Harry F. Lawrence and James P. Stephens of Brooklyn and Harry I. Andrews of Housatonic, Mass.

The James Hill Mfg. Company, Providence, R. I., issue illustrated cards calling attention to their new Vulcanized Fiber Roving Can, specially made for them by the Vulcanized Fiber Company of Wilmington, Del. The bottom of the can is made of XXX tin plate, of conical form, with star corrugations. The cans are coated inside and out with a water proof coating that prevents them absorbing moisture and gives them a handsome appearance. They are made in seven different diameters from 9 to 18 inches and 36 inches or less in hight.

The Board Printing Machines made by the Dover Machine Works, Dover, Del., are illustrated and described in a catalogue issued by that firm. The catalogue also presents a number of testimonial letters in *fac-simile* from box makers and others who have used these machines.

An illustrated catalogue issued by Heebner & Sons, Landsdale, Pa, calls attention to their Agricultural Machinery, which is illustrated and described.

We are indebted to the Magnolia Metal Company, 266-267 West street, New York City, for an attractive card calendar for the coming year. The back is celluloid, handsomely printed with an advertisement of the company, giving special emphasis to Magnolia Metal of their manufacture. The cards, 12 in number, are printed in blue and red and slipped in a pocket at the lower end.

American Exposition in China.

Shanghai, China, is to have a permanent exposition of American manufactures and machinery. George S. Bowen, organizer of the association which built the old exposition building on the Chicago lake front, is president of the company who are to carry the gospel of machinery into the Flowery Kingdom. The active manager is Col. M. R. Jefferds, projector of China's first interior railway. Congress may take up the matter at this session, and Senator Jones of Nevada has promised to introduce a bill appropriating the $200,000 which the exposition building will cost.

Mr. Bowen and his associates have agreed to call the immense exchange the American-Chinese Chamber of Commerce. They have already leased ground in Shanghai for the building. W. W. Boyington of Chicago is architect. It is to be 400 feet long and half as broad, with a central dome 100 feet high. The interior will be cut up into aisles and booths in the way familiar to all exhibition goers, and the American manufacturers who want to show their wares to the Chinese will have to pay a nominal rent for the privilege.

The McCormick Harvesting Machine Company are the largest concern to apply for space as yet, with Furst & Bradley, the pioneer plow men, and the Deere Company, makers of agricultural implements, tied for second place. The manufacturers of agricultural machinery, reapers, threshers, plows and wagons will, it is said, command practically an unlimited market, which even the English have made no attempt to corner, and the makers of mining machinery will have immense ore deposits to work their crushers and separators on.

W. R. Townsend of San Francisco, who is now in Tokyo, Japan, on a somewhat similar expedition for San Francisco merchants, will be the resident manager of the scheme, although the main office of the concern will be at 56 Fifth avenue, Chicago. The plans of the building include rooms for the American Consulate at Shanghai and quarters for an American bank.

President Bowen says: "China is the greatest of fields for the expansion of American manufacturing interests. The Chinese farming and mining machinery is of the crudest type, and it would need only the introduction of our implements to make the field our own. You can't teach a Chinaman by means of pictures, but if you show him the machine itself and make it clear to him that it does his work better than the antediluvian implements he has been using for 20 centuries, you impress him and capture him at once. That is what we intend doing—to give American manufacturers, Chicago firms especially, the opportunity to show their goods to Shanghai and the rest of China, and I'm sure that our exchange cannot miss success."

In order to make a final settlement of the trouble which has been going on for a long time between the Nebraska cattlemen and the Indians of the Pine Ridge reservation, over the question of stray cattle on the reserve, Major Clapp, the Indian agent at that place, has decided to build a five wire fence the length of the reservation—namely, 60 miles. It is to be put up in the spring.

At the annual convention of the American Federation of Labor, held last week, at Nashville, Tenn., Samuel Gompers was re elected as president. Kansas City was chosen for the next meeting place. The convention approved the Lodge bill for the restriction of immigration, and decided to appeal to the unions for contributions to aid the striking engineers in England.

The Mercantile Rubber Manufacturers' Association met last week in New York City and discussed the recent advance of 10 per cent. in the price of goods manufactured by the members of the association. It was decided at the meeting that another advance of 5 or 10 per cent. will be necessary, on account of the continued high price of crude rubber. The advance will probably be made on January 1.

STOVE TRADE NOTES.

WESTERN FURNACE ASSOCIATION.

The Western Furnace Manufacturers' Association held a meeting in Chicago on the 21st inst. The attendance was quite small, but it was nevertheless an interesting session of the association. F. T. Giblin of Utica, N. Y., a member of the Eastern Association, was present and gave some practical remarks on the need of just such work as the association proposed to do and the disposition of Eastern manufacturers to co-operate. The officers of the Western organization have not made as good headway as they would wish in working up the manufacturers to a proper spirit of co operation. Some are evidently fearful that the association will in some way operate to their disadvantage and prefer to continue the old practices of long credits, consignment of goods, &c., which have brought the Western furnace business to such a low ebb. The Eastern manufacturers are working in such harmony, however, that the Western men have not given up hope of being able to accomplish something, and missionary work will be carried on for some time further and more vigorously than ever. Another meeting will be called in the near future to endeavor to get matters in shape for the coming season.

TRAVELING STOVE SALESMEN FOR 1898.

The Michigan Stove Company, Detroit, Mich., will be represented on the road during the ensuing year by the following salesmen, who will cover the territory indicated: L. B. Young will travel in Northern Michigan, A. H. Dane in Southern Michigan, Louis Hayward the city of Detroit, James W. Weldon in Ohio, George G. Garey in Indiana, Fred. E. Goodman in New York and Pennsylvania, Harry S. Goodman in Kentucky, Tennessee and the Virginias; William D. Maunger in Georgia, Alabama, Mississippi, Louisiana and Arkansas and John G. Taylor in sections of Indiana and Ohio.

The Buckwalter Stove Company, Royersford, Pa., have made arrangements to have their interests looked after by the following salesmen: Ed. Q. Smith in Northern New Jersey, Eastern New York and New York City; George H. Mahood in New England and Southeastern Pennsylvania; Harry W. Kern in Central and Eastern Pennsylvania and Western New York and E. V. Coulston in Western Pennsylvania, Ohio and West Virginia.

The Cleveland Co-operative Stove Company, Cleveland, Ohio, will be represented by O. W. Zehring in Northwestern Ohio and Eastern Indiana, H. J. Topky in Northeastern and Central Ohio, A. J. Walp in New York, Pennsylvania and West Virginia and J. W. Cooley in Michigan.

Schwab & Sercomb, Milwaukee, Wis., will have their interests looked after by Nelson C. Parker in Illinois, Iowa and Northern Missouri and Kansas; J. M. McHenry in Wisconsin, Minnesota and Northern Michigan and A. O. Jones in Michigan, Ohio and Indiana.

The Plymouth Stove Foundry Company, Plymouth, Mass., will be represented by Warren T. Simpson in Southeastern and Western Massachusetts, Rhode Island and New York; W. H Dempsey in Northern Massachusetts, Maine, New Hampshire, Northern New York and Vermont.

The Home Stove Company, Indianapolis, Ind., have arranged with the following salesmen to look after their interests: F. T. Meharry in Northern Indiana and Southern Michigan, R. A. Henry in Southern Indiana and Northern Kentucky, L. A. McCammon in Iowa, Charles L. Vining in Missouri, J. W. Roraback in Wisconsin, C. F. Mills in Illinois and John Haskett in Ohio.

The Excelsior Stove & Repair Mfg. Company, Quincy, Ill., will be represented by C. H. Gunn in Iowa and Nebraska, Theodore Ehrhart in Southwestern Missouri and Kansas, W. J. Fisher in Northern Missouri, H. F. Figgen in Illinois, and Anton Ohnemus, secretary of the company, will call on the jobbing trade.

Toledo Stove Company, Toledo, Ohio, will be represented by Henry Werdehoff, who will travel in Ohio, Indiana and the eastern part of Michigan during 1898.

Graff & Co. of Pittsburgh, Pa, have arranged with F. F. Jeffreys, William Hineman and William Eccles to look after their interests on the road during the year 1898.

The Ringen Stove Company of St. Louis, Mo., will be represented on the road by W. S. Ley, who will travel in a part of Indiana, Ohio and Michigan, Kentucky and West Virginia; W. A. Lockwood in Kansas, Colorado, Indian Territory and Oklahoma; A. X. Smith in Iowa; Louis A. Buck in part of Minnesota and Missouri, Wisconsin and New York; H P. Gingrich in Illinois, Tennessee and South; E. L McBride in part of Minnesota, North and South Dakota and Nebraska; R. S. Buck in northern California, and John A. Preston in Florida.

The Favorite Stove & Range Company of Piqua, Ohio, will have their interests looked after by W. H. Pier in Wisconsin; W. L. Miller in Iowa and northern Illinois; C. Winkelmann in central and southern Illinois; J. C. Frame in northern half of Indiana and part of southern Michigan; J. E. Schroyer in southern half of Indiana; Thomas B. Clemons in northern half of Ohio; Cloyd Smith, in southern half of Ohio, and J. C. Taylor, J. S. Cadot and George A. Simpson in Michigan. The trade in Minnesota, the Dakotas and the far West will be looked after by the St. Paul branch, while the Kansas City branch will take care of the trade in that vicinity.

The S. M. Howes Company of Boston, Mass., will be represented by J. H. Brown, who will visit dealers in the cities of Massachusetts and Vermont; A. J. Marlatt, who will cover the State of Connecticut and a portion of Massachusetts; R. B. Curtis, who will look after the company's interests in southern Massachusetts and Rhode Island, and F. B. Neefus, in Maine and New Hampshire.

The Bloomington Stove Company of Bloomington, Ill., will be represented by M. U. Hagaman in the territory east of Illinois and Indiana; J. B. Wilson west of Illinois and east of Iowa, and Taylor Henderson in the rest of Iowa.

ODD PLATES.

P. F. & A. T. Jones of Nashville, Tenn., have been appointed Southern agents for the Schill New Idea Furnace, made by Schill Brothers of Crestline, Ohio. This Furnace, we understand, was awarded a gold medal at the Tennessee Centennial Exposition recently held at Nashville.

Carey A. Moore of the Charles C. Heath Company, 4 North Liberty street, Baltimore, Md., was one of the visitors at *The Metal Worker* office last week. Mr. Moore reports a steadily increasing trade for their National Hot Air Furnace in sections where a high grade Furnace is desired. He also reports a gratifying season for their Empire State Heating Stove, which is of the tamale type of the best grade, it being provided with a cast iron bottom and top and an ash pit, and arranged for burning either coal or wood. The Stove is oval in form, and the steel body is corrugated in order to improve its appearance. The Stove is likewise made with a cast iron front, which is corrugated in design to correspond with the steel

body. When used for coal the Stove has a cast iron lining. It is provided with a nickel plated top cover, so arranged that the nickel is said to remain untarnished. Another of their leaders is the Grand Range, which is provided with a snug hearth and a very handsome and extra deep base. It is furnished with either a duplex or flat grade, and made in two sizes with 10 and 20 inch ovens. It has nickel plated top bands and a handsome nickel plated name plate for the oven door, and can be supplied with all the usual extension shelves and top shelves, and also water back or reservoir, as desired. One of the most attractive features of the Range is said to be the price at which it is quoted by the house. A Stove for which they have had a fine demand this fall is their Park Square Stove of the self feeding type of a very pleasing design, and which seems to have been a successful leader with many of their customers.

Arrangements are being made to heat Grant's Tomb in this city with Gas Radiators, in order to prevent the sweating of the massive masonry, and also for the comfort of the visitors and attendants.

The French Consul at Smyrna, Turkey-in-Asia, in a recent report to his Government, says: "Petroleum Stoves for heating rooms would be likely to do a big trade. The first were sent here from Germany, and immediately realized a large sale. They cost from 25 to 50 francs, according to size, and only burn very little petroleum. As gas is dear here, whereas petroleum is cheap, it is certain that the use of petroleum Stoves will be general in a very short time, and they will be imported in large quantities."

One of the attractions which John P. Ley, 239 Water street, the New York City manager for Charles Noble & Co., Philadelphia, is displaying in his showrooms is the new Quick Meal Wickless Blue Flame Oil Stove. This Stove has a pressure regulator so that the amount of oil in the tank does not have an effect on the hight of the flame. The lever which controls the size of the flame is provided with an attachment so that the flame can be adjusted to burn indefinitely at a desired hight. The Stove burns with a blue flame, and there is no cotton wick to become charred or need renewing.

William Jackson's Sons, 246 Front street, New York City, display such a handsome line of Grates, Mantel Fire Place Linings, Fire Dogs and Fire Place Trimmings, that one could readily form the idea that it was a Christmas display. These goods, however, are standard with the house. The use of onyx, silver plate and handsome tile contribute much to the beauty of their productions.

D. G. Cooper, Pequabuck, Conn., in a letter informs us that the trade in Oven Thermometers has increased during the past year and that their use is becoming more generally understood by the public, and the advantages of this device are recognized to the extent that Stoves provided with a Thermometer are sought by prospective buyers.

Benjamin Burton, for many years connected with the Ransom Stove Works of Albany, N. Y., died suddenly at his residence on Second street in that city on December 11. He was 72 years of age, and was one of the best known residents of Arbor Hill.

In a recent interview by a representative of a local paper Black & Germer of Erie, Pa., stated that the volume of their business last season was very much in excess of that of a year ago. They worked ten hours a day, gave employment to an enlarged force, and look forward to increased sales during the ensuing year.

The Gobeille Pattern Company of Cleveland, Ohio, are sending out a postal card on the back of which is a large red panel bearing in bold faced black letters the inscription: "We do not sell duplicates, nor make more than one set of patterns from a single original model." Above this in the center of the card is a *fac-simile* of their trade-mark, while at the bottom of the panel is the company's signature. Another postal card argues for new patterns by pointing out the absurdity of keeping up with the style in other matters and lagging behind in the style of Stove construction and decoration.

The Foster Stove Company of Ironton, Ohio, and Louisville, Ky., have issued a 20-page supplement to their catalogue, in which attention is directed to the new Stoves added to their already large assortment for the fall of 1897 and the spring of 1898. The company state that they aim to keep abreast of the times, and in their Foster Range, Foster Jewel, Foster Pride and Foster Air Tight they have a line possessing selling features which cannot fail to command the attention of the trade. The Foster Range is a richly decorated substantial six-hole construction with removable top and front oven plate, large reservoir and capacious oven. The Foster Air Tight Parlor Heater is of the down draft variety, the air being admitted from the top and carried down through a pipe which is in contact with the fire, thereby heating the air before it reaches the fuel. It is made in three sizes and is of attractive exterior. A Stove which is made for burning slack is constructed on the reservoir principle, and is known as the Foster Slack Burner. Directions for setting up and operating the Stove are given as well as sectional views indicating the internal construction.

A final decree by consent has been rendered in the United States Court for the District of Indiana in the suit brought by Bucks Stove & Range Company against the Southern Stove Works, concerning the use of white enamel lining for oven doors by the latter concern. The Bucks Stove & Range Company waive all claims for damages and the Southern Stove Works are restrained from any further use of white enamel on their Cook Stoves or Ranges in such a way as to enable them to be sold under the name White Enamel.

Among the first calendars for the new year which have reached us is the one sent out by the Fuller & Warren Co. of Troy, N. Y. In its general style and make-up it is similar to those which have been distributed by this concern for a number of years past. The basis of the calendar is a heavy card, measuring about 14 x 11 inches and carrying 13 leaves varied in color, representing the different months of the year, the last one being devoted to a counting house calendar, covering not only the 12 months of 1898 but the first six months of 1899. The printing is in a brown ink and at the bottom of each leaf in white outline letters is the name P. P. Stewart. The leaves measure about 11 x 8¼ inches, thus leaving a border on the cardboard. This has a bronze ground upon which in dark brown letters appear the name and address of the company, the year and the inscription "All Stoves, Furnaces and Ranges bearing the name Fuller & Warren Company are guaranteed of the best material and workmanship." The card is provided with a metal loop for hanging it up, and upon the back is a bird's eye view of the company's works, together with the names of some of the leading lines in the way of Cook Stoves, Ranges and Heaters which the company manufacture.

The W. L. Armiger Mfg. Company have recently been incorporated at Baltimore, Md., with a capital stock of $50.000, for the purpose of engaging in the manufacture of Stoves, &c. The incorporators are William L. Armiger, Waldo Newcomer, Charles G. Kriel, Daniel A. Klein and William A. Kammerer.

The Bloomington Stove Company of Bloomington, Ill., look for an improved business next year, and state that in order to hold their own they have gotten out an entirely new line of Cook Stoves and Ranges with square ovens in all styles and sizes. The smaller sizes they expect to have on the market by February 1. They are also getting out patterns for Hard Coal Base Burners, Oak Stoves and Air Tight Heaters. In fact, they are contemplating adding to their present goods new patterns all around. They are taking an inventory two weeks ahead of time in order to get their new goods on the market, and will resume active operations at their works the first week in January. We understand that they have a number of orders on hand for their new goods, these being for early delivery in February.

The Chicago Stove Works of Chicago, Ill, have brought out a new Steel Range, which they are offering under the name Gold Coin. It is referred to as being of moderate price, has asbestos lined walls, reversible duplex grate for wood and coal, front draft hinged, giving access to the fire box under the front linings, capacious reservoir and handsome nickel trimmings. This Range has just been brought out and the manufacturers intimate that dealers will want the entire line in 1898.

The Estate of P. D. Beckwith of Dowagiac, Mich., proprietors of the Round Oak Stove Works, have just completed the patterns for a steel Range which will be added next year to the Round Oak family. We understand that it will be manufactured as a specialty in connection with their cast Ranges.

The Detroit Manufacturers' Club held their annual dinner at the Hotel Cadillac, Detroit, Mich., on the evening of Friday, December 17, which was regarded as the most successful in the history of the organization. The speeches were of a high order and related to the importance of organization among manufacturers, just and humane treatment of employees and to the railroads and their bearing on the manufacturing industry of the city. The president of the club, George H. Barbour of the Michigan Stove Company, made some very interesting remarks congratulating the members of the club on their large representation, and afterward he read a short paper on "Home Support," in which he urged the necessity of patronizing home manufacturers and home retailers.

In planning out their business for next year the Henry E. Clark Company, Boston, Mass., have arranged for an excellent line of goods, including several lines of Refrigerators, also Blue and White Flame Oil Stoves, Gasoline Stoves, &c. They have likewise made arrangements for the sale of four lines of Bicycles, and are putting a special man on the road to work up this trade as a branch of

their other large jobbing business. As mentioned briefly in *The Metal Worker* last week, they have leased a large store at 56-58 Union street, running through to Friend street, which they will occupy early next season, and which will give them a first-class store with all the modern improvements.

The "Western Stewart" Patent Case.

The readers of *The Metal Worker* will recall the fact that, about a year since, the Circuit Court of the United States for the Southern District of Ohio rendered a decision against Herman Soehmer, a customer of the Fuller-Warren Company of Milwaukee, Wis., in a suit brought for the intringement of certain patents belonging to the Favorite Stove & Range Company of Piqua, Ohio. The Fuller-Warren Company defended their customer and appealed the case. On the 7th inst., in the Circuit Court of Appeals, Sixth Circuit, the decree of the court below was reversed and the cause was remanded with directions to the court below to dismiss the bill. The Fuller-Warren Company have issued a circular to the trade, setting forth the circumstances attending this suit and their final success, and reviewing in caustic language the position of their opponents. We take from this circular some extracts from the opinion handed down by the Court of Appeals, as follows :

"It is claimed for this patent that it provides more space for the flues and oven without increasing the cost of the stove. Whether this is so with respect to the flues seems to be upon the evidence dubious. The reasons advanced for believing it are not very satisfactory. If the oven is enlarged the curving in of the side plates at their edges must necessarily involve the use of more material than if the plates were vertical throughout. But it is not necessary for us to decide how the fact is with regard to the increase of the oven space by the proposed construction. It seems clear that if the bottom plate is contracted to diminish the material it must be at the expense of the flues. It is true that the bringing of the oven doors back upon the rear projection of the side plates might, from the size given to the doors, induce purchasers to believe that the oven is larger than it really is. But that would be a species of deception which could hardly be said to be an improvement in a useful art which the patent laws are designed to encourage."

In considering the status of the prior art in the construction of the flues, the court says:

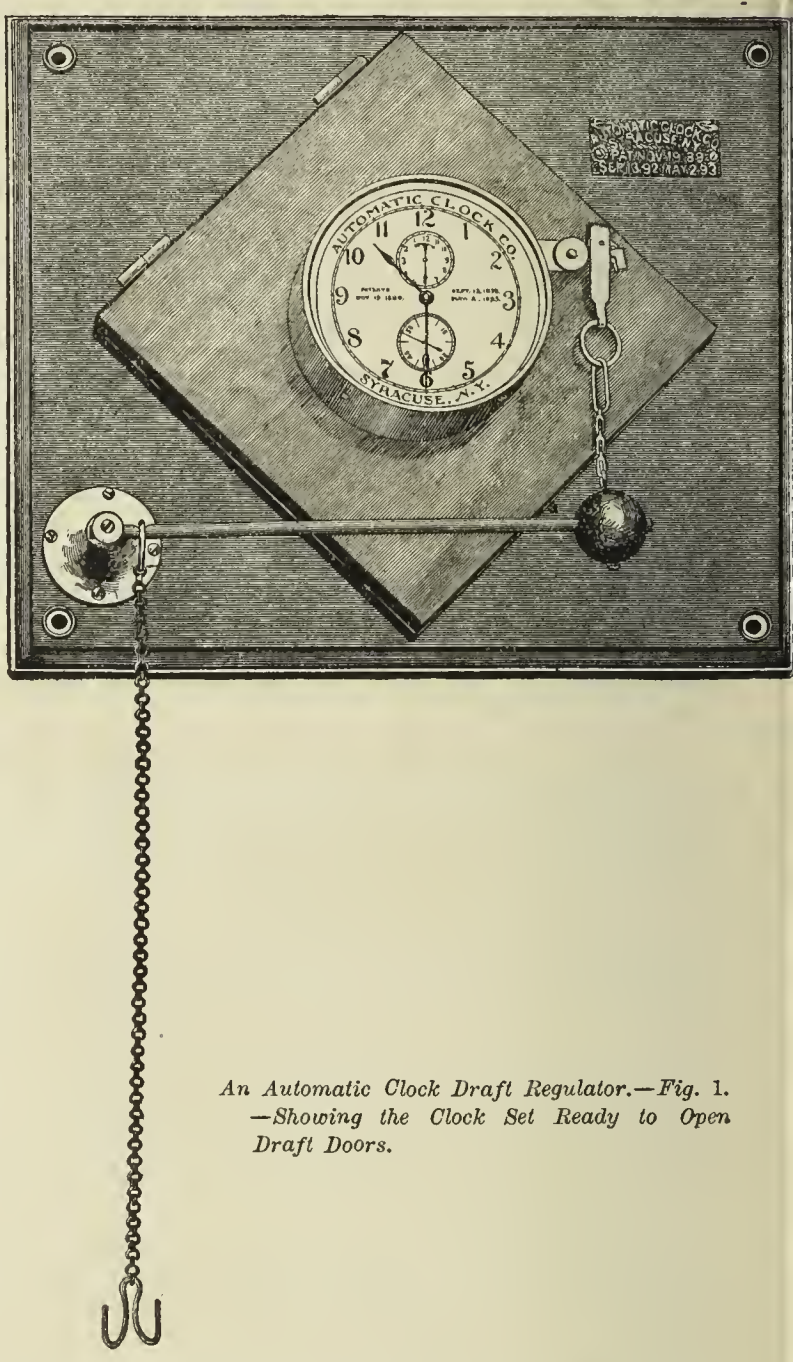
"It is shown by the evidence in the record that as early as 1877, and for several years thereafter, Gurdeon G. Wolfe of Troy, N. Y., made and sold a large number of stoves having a similar curvature and expansion of the side plate along the side of the flue extending under the bottom of the oven. This device of Wolfe, after some modifications, was patented to one Gobeille of Cleveland. In this patent the back flue, it is said, was extended by curving the wall of the flues adjoining the sides. This is testified to by the witness Keep, who was engaged in the stove business at Troy at the time, and he is corroborated by Wolfe himself, who was produced as a witness, and also by the witness Hagan, a mechanical expert and solicitor of patents, who examined one of Wolfe's stoves in 1879 while a suit was pending concerning the validity of a patent involved in its construction."

Again on this question of anticipation, the court further says:

"There is much evidence in the record in regard to the Garland stoves, which the appellee produces as anticipating the patent in suit. It was proven by the appellee clearly enough that the Garland stove, which also possesses the same circular formation near the edges of the side plates, was manufactured and on sale prior to the date of Boal's application for his original patent, and that Boal must have known this. But after this proof was in, the complainant offered evidence to show that Boal's invention was prior to his application and antedated the production of the Garland stove by a short period of time. It may be true. We do not decide that question. The circumstances are such that we should feel impelled to look into it more critically if we were not satisfied that Boal had been anticipated in another quarter. It seems altogether likely that both the Boal and Garland stoves are simply the adoption and expansion of old constructions."

The design patent related to a design employed in the form and ornamentation of the complainant's stove. The court says with respect to this :

"The form is stated to embody round corners on the front frame plate, the edges of which are flush with the edges of the curved door. The ornamentation consists of scroll work on the outside borders of the larger side members of the stove and upon the body of the smaller members, which lack room for the advantageous representation of such work upon their margins. . . . The first claim is the only one involved in the controversy. It is not urged that any of the others are infringed. The art of ornamentation with scroll work is ancient. The classical sculpture and architecture of the old civilization employed it in various styles and in a variety of their productions, and its use has been continued and enlarged not only in the old departments of the arts, but in new and familiar productions in domestic life. Not only the columns, capitals, walls and ceilings of buildings and tapestries, old and new, illustrate it, but the counterpanes of beds, the covers of tables, and the borders of the pages and covers of books and magazines are some of many other things seen in almost universal use."



An Automatic Clock Draft Regulator.—Fig. 1. *—Showing the Clock Set Ready to Open Draft Doors.*

In finally summing up its conclusions upon the design patent, the court said :

"To declare the defendant's stove an infringement, would be to concede to the Boal patent pretentions broad enough to cover the whole field of ornamenting stoves with scroll work, applied according to the generally approved style and methods of the art. As this concession must be denied, it follows that the alleged infringement must also be denied. The decree of the court below will be reversed, and the cause remanded with directions to the court below to dismiss the bill."

An Automatic Clock Draft Regulator.

To meet the complaint that a "heating job won't warm the place early in the morning," the heater draft regulating attachment of the automatic clock is manufactured by the Automatic Clock Company of Syracuse, N. Y. It holds the fire in check at night, and opens one or all drafts at a set time in the morning, thus assuring a comfortable temperature at any hour. Fig. 1 shows automatic clock with its rod and attachment for heater chains. The clock, with its sliding bar drawn out toward the track, forms an obstruction which detains a traveler on an inclined track. This traveler is attached to one end

of a brass drop lever, the other end being held firm in a swinging shoulder. The chain or heater attachment is slid along the rod, close to the shoulder, and is now ready to receive the chain or chains which run to the heater. There is no alteration to be made in the chains for a hot water or steam heater, the chain which runs from the long arm of the lever when hung on the heater attachment holding the fire in check. A slight alteration for a hot air furnace is made by arranging a counterweight sufficient to open the draft, as shown in Fig. 2. A chain from this counterweight and the chain from back draft when hung on the heater attachment shuts off all drafts.

It is supposed the clock has been wound up and set for the time desired for turning on the drafts in the morning.

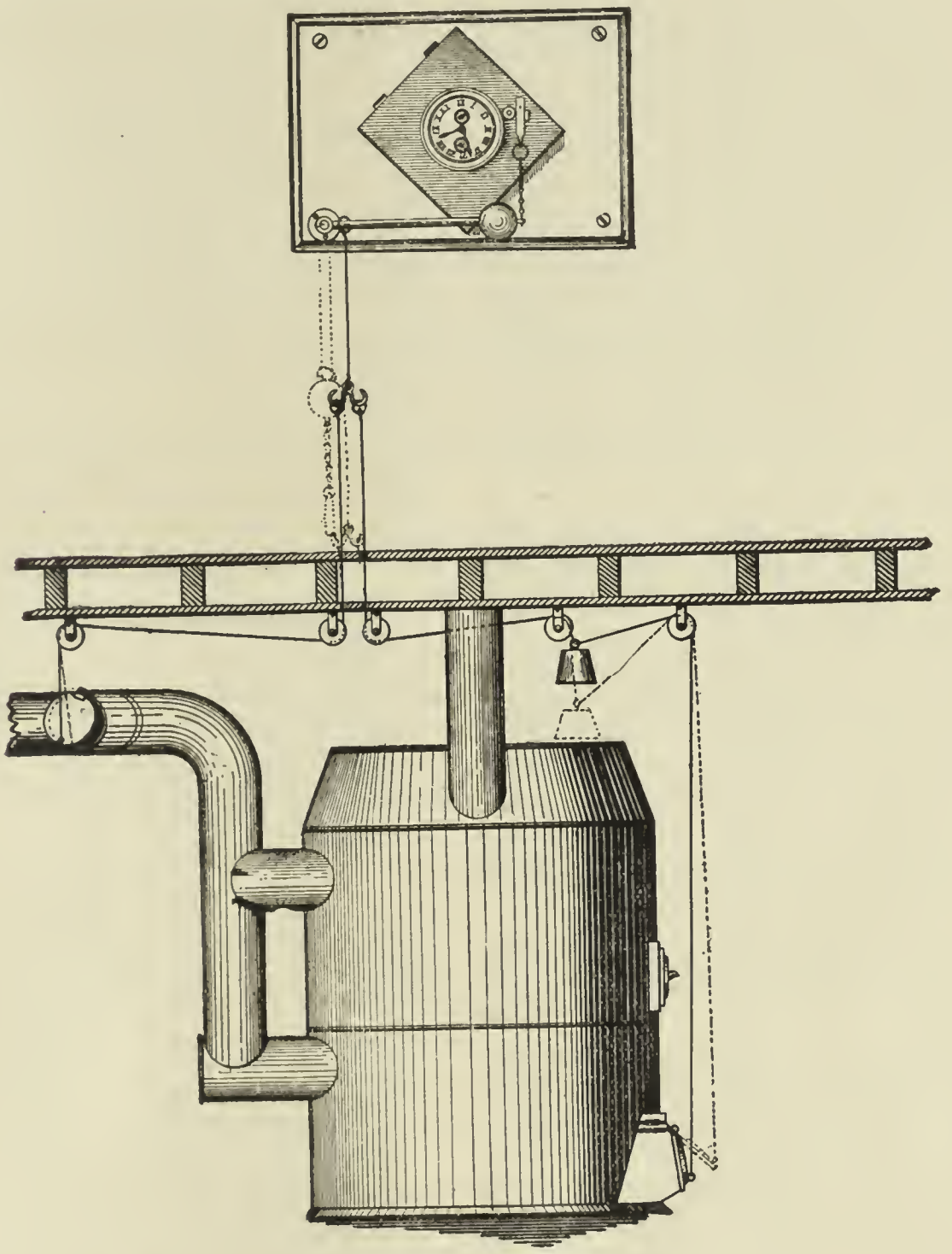


Fig. 2.—Showing the Device Arranged to Open the Drafts of a Furnace.

The fire has been fixed for the night, and the consumption of fuel has been limited or stopped. At the set time in the morning the bar slides into the clock. The obstruction being removed, the traveler rolls off its inclined track, the rod drops the heater chains and all drafts are on. The consumption of fuel begins at once, and by the time the heat is needed the building is thoroughly warmed. This automatic device does not interfere with the independent working of the regular chains by hand during the daytime. The device is strong enough to operate any combination of heater drafts such as may be found in churches, schools, public buildings, &c.

W. H. Colebrook & Co., Syracuse, N. Y., manufacturers of Stove Polish, Asbestos Cements, Paper Mill Board, Plumbago and other specialties, are recalling themselves pleasantly to their customers with a Christmas card bearing a spray of evergreen, the universal emblem of the season of good will.

We are advised by Charles Josselyn, general manager of the Great Western Can & Machine Company of San Francisco, Cal., that the company have purchased the tin can manufacturing plant of the San José Fruit Packing Company, San José, Cal., and will locate their works at that point. The Jensen and Wheaton machines which were used by the San José Fruit Packing Company will be replaced by special cau making machines recently invented by Axel Johnson and owned by the Great Western Company. The new plant will, it is expected, be in operation by May 1. It will have a capacity of 4,000,000 cans a month. The advantages offered by San José as a location for this industry are excellent railway shipping facilities and the use of oil for fuel.

Booker T. Washington, principal of the Tuskegee Normal and Industrial Institute, Tuskegee, Ala., in his annual report, just published, makes an earnest plea for funds to build and equip a trade school building for the proper accommodation of that important department of the work of the institute.

In our trade columns will be found the new price-list for Registers and Ventilators adopted by the manufacturers under date of December 20, 1897. The adoption of this new list will, it is expected, do away with the confusion which has existed among the trade heretofore owing to the existence of two lists for these goods.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Wholesale values have fallen slightly and the tone of the market is a shade weaker. Foreign market news has been tame in the extreme, and alone served to restrain buyers' operations more or less. Some accumulation of stock here, together with the heavy shipments from the Straits during the first half of December, had some influence in the same direction. Consumers have been buying very moderately. Jobbers continue to quote small lots of Straits Pig from stock at 14¾c. per lb.

Copper.—None but ordinary transactions have been reported during the week, but the market has retained very good tone and it is more than possible that the business effected was larger than admitted. In any event wholesale prices have ruled firm, in the face of dull London accounts and some local statistical effort in the direction of creating erroneous impressions regarding European consumption. In a small way business was of very limited proportions, but retailers' prices are firmly held at about 12¼c. per lb. for Lake Ingot and 11¼c. for Ansonia Grade Casting Copper in small lots from store.

Sheet Copper.—A tame demand is reported, business being confined almost entirely to orders for small lots for immediate use. Sheet Copper, in a retail way, is quoted by dealers at about 15c. per lb., basis.

Pig Lead.—In this line dullness has been the most conspicuous feature. Large consumers have purchased nothing to speak of, while the smaller ones and other buyers bought only as immediate wants required. Jobbers' prices for American Pig are rather weaker, ruling at 4⅛c. to 4¼c. per lb. for small lots.

St. Louis advices are as follows : The Pig Lead market has firmed up very materially since our last report. There are plenty of inquiries on the market, and the anxiety of some consumers to place orders has verified the opinion of sellers that nearly all consumers are short of stock. The market closed with prices firm and with the possibility of a substantial advance within the next few days.

Lead Pipe and Sheet.—The usual end-of-the-year dullness influences the market for these materials. Consumers are buying nothing beyond what their immediate requirements call for. Prices are unchanged in the Eastern market, Lead Pipe being quoted at 5¾c. and Sheet Lead at 6¾c. per lb., subject to a discount of 20 per cent.

Spelter.—Competition in this metal has continued keen and the market remains in a rather weak condition, with a spiritless demand from consumers in this quarter. Jobbers' prices continue at 4.45c. to 4½c. per lb. for good Western brands.

St. Louis advices are as follows : Spelter shows some signs of improvement. Some liberal purchases have been made, and efforts have been made to place orders for delivery during the first quarter of 1898 at the current prices, but sellers are slow to accept them.

Antimony.—There has been about the usual jobbing business, and prices are steady. We quote at 7¼c. to 7½c. for Japanese, 7½c. to 7¾c. for Hallett's and 8½c. for Cookson's, in small parcels.

Nickel.—Prices remain steady at about 37c. to 38c. for small quantities.

Tin Plate.—While American Cokes have been selling very fairly, chiefly for delivery between March and June, the amount of business in this line has hardly reached last week's volume. The prices at which the orders were booked were invariably low, and the market shows little improvement in tone. In other varieties of Plates, business has been exceedingly tame. Nevertheless the mills are all well occupied and there is little or no actual pressure of offerings, while stocks are quite light. The retail trade, as is usual at the close of the year, has lapsed into a condition of extreme dullness, with no features of interest. Jobbers' prices unchanged, moderate sized lots of American Plates for spot delivery at New York, Philadelphia or Baltimore being about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3 60 ; do , 100 lbs., $3.40 to $3.50 ; do., 95 lbs., $3 35 to $3.45 ; do., 90 lbs., $3.30 to $3.40 ; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75 ; Allaway Grade, IC, 14 x 20, $4.25 ; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are in very limited demand and prices are without quotable change.

Sheet Iron.—Few new orders have been placed during the week and a general shut down of the Eastern mills is expected during the coming week. Inquiries covering good sized lots are being received, which will probably materialize early in the year. The Sheet mills are generally well satisfied with the last few months' business, both as to volume and prices, and the outlook for 1898 is regarded as bright. Jobbers' business in this section is rather quiet at present, but prices remain firm. Small lots from stock sell at about 2.35c. to 2.40c. for No. 27 Common Black Sheets and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows : The feature of the Sheet market at present is the receipt of heavy inquiries for delivery extending over the greater part of next year. Some of the large buyers are now willing to cover their requirements far ahead if it can be done at present prices. It is doubtful, however, if the manufacturers will sell much in advance at present rates. Small lots from stock are selling at 2.20c. to 2.25c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—Very little business is reported, consumers generally being anxious to avoid taking in any stock until after the first of the year. The market, as a whole, is devoid of any feature worthy of comment. Prices, while nominally unchanged, are inclined to weakness. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here :

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3¼c.
Zinc	per lb. 2¾c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10 50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5.25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	5.00

CHICAGO REPORT.

Scrap.—Business is very quiet, but much confidence is felt in the future. A heavy demand is expected after the opening of the new year. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$6.75	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—The demand continues light and prices are cut. The card on carload lots of 12 tons minimum is as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60

Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8 60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6 50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE IRON MARKET.

The news shaping the course of the markets in the near future is somewhat contradictory. In the West the demand for Finished Iron is quite heavy. There have been quite considerable purchases of Bessemer Pig in the Central West, and the market has strengthened to $9.50 Valley furnaces and $10 Pittsburgh.

For a long time the Southern Pig Iron makers have maintained a strong attitude, and there was practically a deadlock between buyers and sellers, in which the latter seemed to have the more advantageous position, with the statistical sitnation to back them up. During the last week they have suddenly weakened, and the market is about 25c. off.

The Wire trade has continued quite active under the stimulns of the negotiations for consolidation. It is reported that one large Barb Wire concern in the Chicago district, who do not control their own Rod supply, are a party to the deal, while negotiations are pending for another large plant, similarly situated, in the Central West.

It is intimated that the consolidated company will pnrchase what ontside supplies of Steel Billets are required from two of the largest plants in the country under special contracts which exclude as buyers outside consnmers for the Wire trade.

Numerous reports are cnrrent with reference to the Wire consolidation, from the statement that a very serious obstacle defeating the whole scheme has been met to the assertion that it is bound to go through and will make $6,000,000 per annum. Deducting $2,450,000 for 7 per cent. interest on $35,000,000 preferred stock, this, according to the estimate in question, would leave over $3,500,000 for the common stock, which, we are told, is to be the favorite of the insiders. Since some of them have earned 25 and 27 per ceut. on their capital in recent years, it would take a pretty heavy discount from par to tempt them.

Pig Iron.—In the New York market considerable surprise has been created by the sudden weakening in Southern Irons, which had been firmly held for a considerable period. It has seemed all the more inexplicable because the statistical position is generally regarded as very favorable. There is some talk of an early advance of about 15c. on freight rates in Southern Iron. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10 75 to $11. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.75; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

There is a great deal of inquiry for Pig Iron in the Philadelphia market, and some fair sized lots have been taken, but there is a want of uniformity in prices that is rather discouraging. Some holders are decidedly weak kneed and have not maintained qnotations with that firmness which the situation has seemed to warrant. Under this feeling buyers hesitate to pay the usual asking rates, although at 10c. or 15c. less it is believed that a very large amount of business could be entered. Sellers are disposed to meet the demand in a liberal spirit, and while as a rule quoted rates are adhered to, favorable deliveries are granted, say three or four months, at qnoted rates, possibly six months in special cases. For the present sales are chiefly at inside quoted rates, which for seaboard deliveries are as follows, subject to the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75 to $11.

Only moderate sales of Pig Iron are reported in Chicago by the local producers and Southern sales agents. Shipments in some cases are being delerred, as foundrymen who take inventory at the close of the year want light stocks. Inquiries are somewhat better for both local and Southern Irons, but buyers are evidently feeling the market and are not yet convinced that it is time to place orders. The temper of the trade, however, is shown by the fact that a contract for 5000 tons of Foundry Iron has been offered to producers at a shade under present quotations and refused. The movement of Lake Superior Charcoal continues light, but prices are maintained in this market. We quote for cash as follows:

Lake Superior Charcoal	$12 50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.60 to 11.00
Southern Coke, No. 3	10.35 to 10.60
Southern, No. 1 Soft	11.00 to 11.25
Southern, No. 2 Soft	10.60 to 11.00

In the Pittsburgh district the market for Bessemer Pig Iron is quiet but firm. Foundry Irons continue quiet. For first quality we quote, f.o.b. cars Pittsburgh district, as follows: No. 1 Foundry, $10.50 to $10.75; No. 2 Foundry, $10 to $10.25; Bessemer, $10 to $10.15.

THE HARDWARE TRADE.

The near approach of the end of the year brings with it a falling off in the volume of general business, but all classes of trade, including manufacturers and jobbers, find the time fully occupied with current trade and the matters which naturally call for attention at this season in connection with the closing up of the year's operations and the plans for 1898. Holiday amenities and festivities are also naturally making a place for themselves. Travelers are more generally coming home, but many are still in the field finishing up their routes. From some sections the reports of continued trade are exceptionally good and, with the purchasing which has been stimulated under special circumstances in some leading lines, the month of December will make an excellent showing in the aggregate of the year's business. The matter of the negotiations for the consolidation of Wire Rod interests has withdrawn for a time from public interest while the questions of valnation, &c., are being considered; but the market feels to some extent the influence of the project and prices in Wire and closely related goods are firm. Some lines, however, which will certainly be affected by the success of the movement have not as yet responded in the matter of prices. The important conferences with reference to the consolidation of Enameled Ware interests continue and are referred to by those closely identified with them as favorably progressing. An improved tone in the Screw market is noticeable. Prices generally remain without important change, but in some cases, owing to a falling off in the demand and the solicitude of manufacturers to book orders, they are a little softer. The confident tone in regard to next year's business continnes and a hopeful feeling prevails.

Advices from Chicago.—A phenomenal business is reported in Shelf Hardware. The demand for goods is so heavy as to interfere seriously with those who take stock at this time. The entire force of the leading house here has been obliged to work at night for some time, trying to keep up with daily business and also to take inventory. It is expected from present appearances that December will run far ahead of November in volume of business. Reports received from other Western jobbing centers are of the same character. The statement is made that some of the leading houses last week had the banner days in their history for heavy trade. Manufacturers' agents report an excellent business coming from all localities they visit. The condition of affairs in this line is most unusual. Ordinarily at this time travelers are coming home and business is extremely light. Jobbers of Tinware and House Furnishing Goods also report a continued good demand in their line, although business is not qnite so active as in strictly Shelf Hardware. Heavy Hardware jobbers report a somewhat smaller business now than during the early part of the month. A good demand, however, is coming from special branches. The business with contractors and other irregular buyers has been particularly pronounced. Large orders have been received for Jack Screws and other tools used for heavy operations and public works.

Advices from St. Louis.—Holiday dullness now prevails throughout the Hardware trade, and the balance of the year will be largely devoted to inventories. The year just closed is sure to prove a satisfactory one to nearly the entire jobbing trade. The volume of business will show a material increase, and the year gives promise of closing with prices in a condition which can be described as steady to strong.

NOTES ON PRICES.

Wire Nails.—The week under review did not witness any special change in the condition of the market on Wire Nails. The manufacturers are very conservative in the matter of accepting orders for future delivery, and are in most cases limiting them to those which can be executed

during the present month. The demand from the trade has fallen off for some time, which is accounted for by the fact that many of the houses have covered their pressing requirements. The length of time that will be necessarily occupied in negotiations looking to the success of the consolidation of Rod interests also tends to make the buyers less eager to place their orders for Nails. The price continues unchanged.

Advices from Chicago.—Manufacturers have had an active week and are in receipt of a heavy inquiry for future delivery, but with very few exceptions they are not yet taking orders for shipment beyond this month. Jobbers are in receipt of good orders from the country trade, but as yet little or no indication is shown of speculative buying from that quarter. Small lots are quoted at $1.55.

Advices from St. Louis.—The market is dull and prices are somewhat easier. The excitement which permeated the market on account of the possible consummation of the Wire Rod deal has subsided and there is now no apparent effort to load up in anticipation of an early advance. The outlook for an increased trade after the turn of the year is encouraging and January promises to prove a busy month for the manufacturers of Nails. Jobbers report a light demand and quote $1.65 to $1.70, base, for small lots from store.

Cut Nails.—The demand for Cut Nails is sluggish, but is referred to by the mills as satisfactory considering the season. The fact that Cut Nails for certain uses are coming back into favor and displacing Wire Nails, by which they were temporarily superseded, appears to be one of the features of the situation. Prices are without important change.

Advices from Chicago.—No change is noted in Cut Nails, small lots from stock still being sold at $1.45.

Advices from St. Louis.—The market is without change. Jobbers are asking $1.45 to $1.50 for small lots from store.

Barb Wire.—There is comparatively little doing in Barb Wire, largely owing to the indisposition of the manufacturers to accept orders for future delivery. Jobbers quote small lots of Four-Point Galvanized from store at about $2.

Advices from Chicago.—Manufacturers believe that if they were free to take orders as in past seasons they could dispose of their output for the spring in two weeks. They are, however, only selling for immediate delivery. Jobbers quote prices firmly at $1.60 for Painted and $1.90 for Galvanized in small lots from stock.

Advices from St. Louis—Mills report very little inquiry for Barb Wire, and the same reports come from jobbers. Jobbers quote $1.65 for Painted; 30 cents per hundredweight additional for Galvanized.

Smooth Wire.—The market for Smooth Wire has a firm tone, and manufacturers are conservative in the matter of accepting orders except for immediate delivery.

Screws.—The manufacturers of Screws have during the past month or two had several conferences with a view to determining whether or not there may be some concerted action on their part, but thus far it has not been found feasible to reach a definite understanding. The market is, however, regarded as certainly in an improved condition, and has a decidedly better tone. This is indicated by the fact that while the base price on Flat Head Iron Screws has for some time been 90 per cent. discount, P. & F. Corbin, New Britain, Conn., under date December 22, have issued a circular making the base price 87½ and 10 per cent., their quotations by this circular on the different lines being as follows:

	Per cent.
Flat Head Iron	87½ and 10
" " Japanned	85
" " Brass	87½ and 10
" " Bronze Metal	85 and 10
Round and Oval Head Iron	85
" " " " Brass	85
" " " " Bronze Metal	85
Flat Head Iron Screws, Blued	5 per cent. added

Russell & Erwin Mfg. Company, New Britain, Conn., and 43-47 Chambers St., New York, are also issuing a circular December 22, naming the following discounts:

	Per cent.
Flat Head Iron	87½ and 10
Round and Oval Head Iron	85
Flat Head Brass	87½ and 10
Round and Oval Head Brass	85
Flat Head Bronze Metal	85 and 10
Round and Oval Head Bronze Metal	85
Flat Head Japanned	85
Flat Head Iron Screws, Blued	5 per cent. advance on net

There is a general disposition on the part of the manufacturers to adopt a base of 87½ and 10 per cent. discount, and there seems to be an increasing probability that such action will be general. The prices now prevailing are recognized as unprofitable, and in view of the prospect of increased cost for the raw material an additional reason is given for obtaining more for the goods.

Enameled Ware.—The projectors of the Enameled Ware consolidation have arranged for a meeting next week, following a series of conferences which have been held from time to time, when, it is believed, definite steps will be taken looking to an amalgamation of many of the leading Enameled Ware interests, together with an absorption of Tinware production. The large capitalization spoken of is intended to give an opportunity for acquiring a number of the smaller factories, not necessarily assuming that the entire amount will be represented in property at the start. The negotiations have been somewhat delayed, it is believed, by certain interests who are holding off for acceptable terms. There are still those more or less conversant with the situation who question whether it will be found feasible to carry the movement to a successful conclusion. In the meantime, we are advised, buyers are anticipating their wants somewhat in view of the possibility of the consummation of the project.

Registers.—For some time there has been some confusion in the market for Registers and Ventilators, on account of there being two lists. The manufacturers have, however, recently been conferring with reference to this matter and have adopted a new list, which, it is expected, will be the standard one and do away with the confusion which has heretofore existed. We print below the list of Tuttle & Bailey Mfg. Company, 83 Beekman street, New York, from which it will be seen that the manufacturers have not attempted to use a list unduly high, but one that will, it is expected, meet the general approval of the trade. The list bears date December 20. The discounts to which it is subject are given below, terms 60 days net, or a discount of 2 per cent. for cash in ten days. It is stated that no freight allowances will be made and on all orders of less than $10 boxing will be charged at cost:

	Per cent.
Black Japanned Registers, Ventilators, Faces and Borders	40 and 10
White Japanned Registers, Ventilators and Faces	30 and 10
Bronzed Finishes in Imitation of Gold, Silver, Copper or Bronze	40
Nickel Plated	40 and 10
Electroplated in Brass, Bronze or Copper	40

Japanned—Black or White.

Wall Frame. 4 in. deep.	Wall Frame. 2 in. deep.	Register Without Valves.	Size of Opening.	Register.	Register Face.	Floor Border.	Ventilator for Cords.
.....	$0.25	$0.55	4½ x 6½	$0.65	$0.20	.....	$0.90
.....	.30	.60	4 x 8	.70	.25	$0.60	.95
.....	.35	.75	4 x 10	.85	.30	.60	1.10
.....	.45	.95	4 x 13	1.10	.35	.65	1.35
.....	.55	1.05	4 x 15	1.25	.40	.70	1.50
.....	.65	1.25	4 x 18	1.45	.55	.70	1.70
.....	.....	2.40	4 x 21	2.75	.85	.....	3.00
.....	.....	2.80	4 x 24	3.25	1.00	.....	3.50
$0.80	.50	.65	5 x 8	.85	.30	.60	1.10
.85	.55	.80	5 x 9	.95	.35	.60	1.20
.85	.55	.85	5 x 10	1.00	.40	.65	1.25
.90	.60	.90	5 x 11	1.05	.45	.65	1.30
.95	.65	.95	5 x 12	1.10	.50	.65	1.35
1.00	.70	1.00	5 x 13	1.20	.50	.70	1.45
1.00	.70	1.10	5 x 14	1.30	.55	.75	1.55
1.10	.75	1.20	5 x 15	1.40	.60	.80	1.65
1.10	.75	1.40	5 x 16	1.60	.65	.90	1.85
1.15	.80	1.50	5 x 17	1.75	.70	.95	2.00
1.15	.85	1.65	5 x 18	1.90	.75	1.00	2.15
.75	.45	.65	6 x 6	.80	.30	* 60	1.05
.80	.50	.80	6 x 8	.90	.35	*.60	1.15
.85	.55	.85	6 x 9	.95	.40	*.65	1.20
.85	.55	.85	6 x 10	1.00	.45	*.65	1.25
.95	.65	1.00	6 x 12	1.15	.50	.70	1.40
1.00	.70	1.25	6 x 14	1.40	.55	.80	1.65
1.10	.75	1.40	6 x 16	1.60	.70	1.05	1.85
1.20	.85	1.70	6 x 18	1.90	.85	1.25	2.15
1.35	.95	2.30	6 x 20	2.60	.95	1.40	2.85
1.50	1.00	2.85	6 x 22	3.25	1.15	1.55	3.50
1.60	1.10	3.40	6 x 24	3.90	1.40	1.80	4.15
.....	.....	3.75	6 x 28	4.40	1.55	2.00	4.65
.....	.....	4.70	6 x 32	5.40	1.85	2.50	5.65
.85	.55	.80	7 x 7	.90	.35	*.60	1.15
.90	.60	1.00	7 x 10	1.10	.50	*.65	1.35
.95	.70	1.10	7 x 12	1.25	.60	.75	1.50
1.05	.75	1.35	7 x 14	1.55	.70	.90	1.80
.85	.55	.90	8 x 8	1.00	.50	*.65	1.25
.90	.60	1.00	8 x 10	1.10	.55	*.70	1.35
.95	.70	1.15	8 x 12	1.25	.60	*.75	1.50
1.00	.75	1.25	8 x 13	1.45	.65	.85	1.70
1.05	.80	1.40	8 x 14	1.60	.70	.90	1.85
1.10	.85	1.55	8 x 15	1.80	.80	*1.05	2.05
1.15	.85	1.80	8 x 16	2.10	.90	1.15	2.35
1.25	.90	2.50	8 x 18	2.90	1.05	*1.30	3.15
1.40	1.10	3.15	8 x 21	3.60	1.35	*1.60	3.85
1.60	1.30	3.65	8 x 24	4.20	1.65	*1.75	4.45
.....	.....	4.05	8 x 27	4.70	1.95	2.00	4.95
.....	.....	4.80	8 x 30	5.60	2.25	2.30	5 85
.85	.65	1.10	9 x 9	1 25	.60	* 75	1.50
1 00	.70	1.25	9 x 12	1.40	.70	*.85	1.65
1.10	.75	1.45	9 x 13	1.60	.75	*.90	1.85
1.15	.80	1.55	9 x 14	1.70	.80	*.95	1.95
1.20	.85	1.75	9 x 15	2.00	.90	1.10	2.25
1.25	.85	1.85	9 x 16	2.20	1.05	1.20	2.45
1.40	.90	2.25	9 x 17	2.65	1.25	1.25	2.90
1.50	.95	2.55	9 x 18	3.00	1.35	1.30	3.25
1.60	1.00	2.80	9 x 19	3.35	1.45	1.40	3.60

1.70	.....	3.10	9	x 20	3.65	1.55	1.50	3.90
.....	.....	3.65	9	x 22	4.25	1.75	1.70	4.50
.....	.....	4.25	9	x 24	4.90	1.90	1.85	5.15
.....	.....	4.65	9	x 25	5.30	2.15	2.00	5.55
.....	.....	5.00	9	x 26	5.70	2.40	2.20	5.95
.....	.....	5.30	9	x 28	6.10	2.65	2 45	6.35
.....	.....	5.65	9	x 30	6 50	2.90	2.65	6 75
1.00	.65	1.35	10	x 10	1.50	.65	*.80	1.75
1.05	.75	1.40	10	x 12	1.60	.80	*.90	1.85
1.15	.80	1.65	10	x 14	1.90	.90	*1.00	2.15
1.25	.90	2.00	10	x 16	2.30	1.10	*1.30	2.55
1.50	1.00	2.65	10	x 18	3.10	1.40	*1.45	3.35
1.75	1.05	3.30	10	x 20	3.85	1.60	1.65	4.10
2.10	.....	4.25	10	x 24	5.00	2.00	2.20	5.25
1.60	1.00	2.50	11	x 17	2.90	1.45	1.45	3.15
1.20	.80	1.95	12	x 12	2.25	1.10	*1.25	2.50
1.40	.85	2.15	12	x 14	2.50	1.20	*1.35	2.75
1.50	.90	2.30	12	x 15	2.65	1.30	*1.40	2.90
1.55	.95	2.50	12	x 16	2.85	1.40	*1.45	3.10
1.60	1.00	2.60	12	x 17	2.95	1.50	*1.50	3.20
1.70	1.05	2.75	12	x 18	3.20	1.60	*1.55	3.45
1.75	1.10	3.05	12	x 19	3.50	1.70	*1.60	3.75
1.85	1.15	3.55	12	x 20	4.00	1.85	*1.75	4.25
2.15	1.35	4.50	12	x 24	5.25	2.50	*2.35	5.50
2.60	.....	6.75	12	x 30	7.50	3.25	2.90	7.75
3.25	2.10	8.75	12	x 36	10.00	4.50	3 50	10.25
1 75	1.10	3.10	14	x 14	3.60	1.65	*1.50	4.10
1.80	1.15	3 50	14	x 16	3.95	1.75	*1.60	4 45
1.85	1.20	3.70	14	x 18	4.30	1.95	*1.80	4.80
1.90	1.25	3.95	14	x 20	4.65	2.15	*2.00	5.15
1.95	1.30	4 25	14	x 22	5.00	2.40	2.25	5.50
2.50	.....	6.00	15	x 25	7.00	3.15	2.45	7.50
1.85	.....	3.95	16	x 16	4.60	2.10	1.85	5.10
2.05	.....	4.50	16	x 18	5.30	2.50	2.30	5.08
2.20	.....	4.90	16	x 20	5 70	2.75	2.40	6.20
2.35	.....	5.40	16	x 22	6.25	3 00	2.60	6.75
2.45	.....	6.10	16	x 24	7.00	3.25	2.75	7.50
2.80	.....	7.50	16	x 28	8.75	4.40	3.25	9.25
3.30	.....	9.00	16	x 32	10.50	5.00	3.60	11.00
2.25	.....	6 10	18	x 18	7.10	3.10	2.55	7.60
2.40	.....	6.90	18	x 21	7.90	3.50	2.85	8.40
2.60	.....	7.40	18	x 24	8.50	3.90	3.10	9.00
2.90	.....	8.80	18	x 27	10.30	4.80	3.50	10.80
3.25	.....	10.00	18	x 30	11.75	5.60	3.75	12.25
3.75	.....	12.20	18	x 36	14.25	7.15	4.50	14.75
2.50	.....	6.45	20	x 20	7.50	3.25	2.75	8.00
2.60	.....	7.35	20	x 22	8.50	3.95	3.00	9.00
2.85	.....	7.75	20	x 24	9.00	4.25	3.25	9.50
3.00	.....	8.40	20	x 26	9.75	4.65	3.50	10.25
3.40	.....	9.55	20	x 28	11.10	5.00	3.80	11.60
3.45	.....	10.70	20	x 30	12.50	5.75	4.30	13.00
3 80	.....	12.00	20	x 32	14.00	6 75	4.75	14.50
4.45	.....	13.70	20	x 36	16.00	8.00	5.25	16.50
.....	.....	7.85	21	x 21	9.15	4.35	3.40	9.65
.....	.....	8.65	21	x 25	10.10	4.85	3.65	10.60
3.45	.....	9.65	21	x 29	11.50	5.10	3.90	12.00
.....	.....	12.75	21	x 33	15.00	7.75	.....	15.50
4.75	.....	15.40	21	x 37	18.00	8.75	.....	18.50
3.45	.....	9.85	24	x 24	11.50	5.10	3.90	12.00
3.65	.....	10.70	24	x 27	12.50	5.75	4.00	13.00
3.95	.....	12.20	24	x 30	14.15	6.90	4.25	14.65
4.20	.....	13.45	24	x 32	15.85	7.75	4.95	16.35
4.60	.....	16.00	24	x 36	18.75	9.00	5.60	19.25
5.60	.....	21.60	24	x 45	25.25	13.00	6.50	25.75
4.00	.....	12.00	27	x 27	14.25	7.15	4.50	14.75
5.25	.....	18.00	27	x 38	21.00	11.00	5.75	21.50
4.90	.....	15.65	30	x 30	18.25	8.50	5.50	18.75
5.50	.....	21.65	30	x 36	25.25	13.00	6.50	25.75
.....	.....	24.85	30	x 42	20.00	15.00	7.50	29.50
7.00	.....	30.00	30	x 48	35.00	18.90	10.75	35.50

Extra Heavy Faces furnished at 50 per cent. advance upon the Ordinary Faces.

* Borders made also without ribs on back.

Round Registers and Iron Borders.

Size of opening.	Register.	Without valves.	Register Face.	Ventilator for cords.	Floor border.
6 inch	$0.70	$0.60	$0.30	$0 95	$0.50
7 "	.80	.70	.35	1.05	.55
8 "	.90	.80	.45	1.15	.60
9 "	1.15	1.00	.55	1.40	.70
10 "	1.40	1.20	.65	1.65	.80
12 "	1.80	1.55	1 00	2.05	1.20
14 "	2.95	2.55	1.50	3.45	1.50
16 "	3.50	3.00	2 00	4.00	1.85
18 "	5.35	4.60	2.75	5.85	2.55
20 "	6.25	5.35	3.25	6.75	2.75
24 "	10.35	8.85	5.00	10.85	4.50
28 "	14.00	12.00	7.00	14.50	5.50
30 "	17 00	15.00	8 25	17.50	6.50
36 "	30.00	27.00	12.15	30 50	9.20

Circular Top Registers, Circular Top Convex Registers and Wall Borders.

Size of opening.	Japanned. Register.	Japanned. Face.	Japanned. Crown wall border.	Hinged Register. Japanned.	Bronzed.
7 x 10	$1.25	$0.60	$0.80	$2.25	$2.60
8 x 12	1.45	.70	1.00	....	....
8 x 14	1.85	.80	....	....	....
9 x 12	1.65	.75	1.10	3.00	3.50
10 x 14	2.15	1.00	1.30	....	....
11 x 16	3.00	1.45	1.65	....	....
12 x 18	3.45	1.70	1.80	....	....
16 x 22	6.50	3.10	....	....	....
High 11 x 13 } Wide	2.40	1.15	....	....	....
13 x 1[illegible] }	3.35	1.55	....	....	....
16 x 17 }	5 30	2.50	....	....	....

Glass.—On Saturday, December 18, the American Glass Company and the glass workers came to an agreement on the question of wages and the scale was signed for the ensuing year. All the factories included in the new association were notified to start their fires within 21 days, as it was agreed that three weeks were to elapse between the signing of the wage scale and the starting of the factories. It is doubtful whether the three-week interval will be strictly observed, as fires have already been started in a number of factories in anticipation of getting work. In fact, the strain was becoming so great that probably the American Glass Company would have given permission to some factories to start up, even if no agreement had been reached. Under the present circumstances new Glass is not expected to be in the market much before February 1. No new prices have yet been announced by the company and jobbers continue to quote 60 per cent. discount on American Glass, but it is stated that the association will issue a price-list January 1 which will advance prices in proportion to the increase in wages recently granted the workers. This means an advance of about 15 per cent over the prices existing before the lockout began. Imported Glass is quoted at 80 and 10 per cent. discount.

White Lead.—There has been comparatively little business in either dry Lead or in Lead in Oil, but buyers show rather more interest in the latter in view of the further considerable rise in cost of Oil. Corroders have made no change in list prices or terms, and jobbers are rather more backward about filling small orders at the 500 pound rate.

Red Lead.—Only ordinary orders have been placed for Red Lead the past week, and the market is without new feature, prices being the same as quoted for a considerable time past.

Linseed Oil.—Owing to further rise in the cost of raw material and indications that the latter will continue high for some time crushers have advanced their prices still further. In retail quantities Raw Oil is quoted at 43c. to 44c. per gallon.

Spirits Turpentine.—Prices have stiffened and the market is very firm at the advance. The demand, however, is moderate at present.

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 23, 1897.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
STP L Grade, 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.80¢	2.50¢
17 to 20	1.90¢	2.60¢
21 to 24	2.00¢	2.70¢
25 and 26	2.10¢	2.80¢
27	2.20¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ℔ lb, A....$10.20 } 10%
Patent Planished, ℔ lb, B.... 9.20 } dis.
Craig's Polished Sheet Steel.....8½¢
U.S. Polished Sheet Steel No. 27 A 5.45¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tnbe, 3¢ ℔ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch np to ¾ inch.....36
Plain, ½ inch up to ⅝ inch.....38
Plain, ⅜ inch up to ½ inch.....41
Plain, 5-16 inch np to ⅜ inch.....08
Plain, ¼ inch up to 5-16 inch.....65
Plain, 3-16 inch up to ¼ inch.....1.00
Plain, ⅛ inch up to 3-16 inch.....1.50
Plain, 2 inch up to 3 inch.....38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots.....℔ lb, 40¢
100-lb lots.....℔ lb, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....℔ lb, 34¢
100-lb lots.....℔ lb, 33¢
Nickel Aluminum Casting Metal.
Small lots.....℔ lb, 39¢
100-lb lots.....℔ lb, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....℔ lb, 35¢
100-lb lots.....℔ lb, 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....℔ lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter.....℔ lb, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 lb or more. Less quantities, 5¢ ℔ lb additional.

Wider than	6-in.	14-in.	24-in.
Aud including	14-in.	16-in.	30-in.
	℔ lb	℔ lb	℔ lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated hy private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Donhle Bead GalvanizedLapJoint80&25%
Double Bead GalvanizedSlipJoint80&25%
Douhle Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Cutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax.....2.20 sqnare
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. ℔ square,	$4.75	$4.50
Galv. ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 sqnare
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20.....8.00 square
Steel Painted, 14 x 20.....7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14.....5.50 square
7 x 10.....6.50 sqnare

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10.....8 50 sqnare
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....℔ lb 2 ¢
" " Brown.....℔ lb 1½¢
" " Purple.....℔ lb 2½¢
" " Ground in oil, B. Red, ℔ lb 6½¢
" " Ground in oil, Red...℔ lb 6½¢
" " Ground in oil, Brown, ℔ lb 5½¢
" " Ground in oil, Purple, ℔ lb 6½¢
Linseed Oil, Boiled, in bbls.....87¢
Linseed Oil, Raw, in bbls.....85¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal....35¢
Asphaltum, Trinidad Refined, ℔ ton.$45
Tarred Felt, 1 Ply, ℔ 100 lb.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl. of 300 lb.....$3.00

NEW YORK, DECEMBER 24.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₱ ℔, 40¢
100-℔ lots.....₱ ℔, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₱ ℔, 58¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 ℔s or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₱ ℔	₱ ℔.	₱ ℔.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.58	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 ℔s 5¢ ₱ ℔ extra.

Antimony—

Cookson.....₱ ℔, 8½@8¾¢
Hallett's.....₱ ℔, 7¾@8¢
Japanese.....₱ ℔, 7½¢

Brass—Planished.....uct

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 20, 1896.

Plain Round Tube.	Per ℔.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.33
½-in. up to ⅝-in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger.	Special
2-in. to 3-in., to No. 19, inclusive.	.38

35% off.

Copper & Bronze Tubing—

3¢ ₱ ℔ more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₱ ℔ 18½@19¢ basis *Ingot.*
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₱ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4¼	5	5¼	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₱ ℔, 2.00....	2.30¢
Nos. 17 to 21.....	₱ ℔, 2.10....	2.40¢
Nos. 22 to 24.....	₱ ℔, 2.20....	2.50¢
Nos. 25 and 26...	₱ ℔, 2.30....	2.60¢
No. 27.....	₱ ℔, 2.40....	2.70¢
No. 28.....	₱ ℔, 2.50....	2.80¢
American B. B.....		₱ ℔, 4¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₱ ℔, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₱ ℔, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₱ ℔ 8½¢

Galvanized.

Nos. 10 to 16.....	₱ ℔, 12¢	75&10& 5% off.
Nos. 17 to 21.....	₱ ℔, 13¢	
Nos. 22 to 24.....	₱ ℔, 14¢	
Nos. 25 to 26.....	₱ ℔, 15¢	
No. 27.....	₱ ℔, 16¢	
No. 28.....	₱ ℔, 17¢	
No. 29.....	₱ ℔, 19¢	
No. 30.....	₱ ℔, 21¢	

36 in. 1¢ ₱ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½@4¾¢
Bar.....5¢
Pipe.....5¾¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6¾¢. 20%
Old Lead in exchange, 3½¢ ₱ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red bbls. and ⅛ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American.....@1½¢
Red Venetian, American.....@1¾¢
Linseed Oil:
Raw, ₱ gal.....43@44¢
Boiled.....45@46¢
Spirits Turpentine:
In bbls.....34½@35¢
In cases.....42½@43¢
Putty:
In barrels and ⅛ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₱ ℔ 5 ¢
Clarified.....₱ ℔ 4¾¢
Accra.....₱ ℔ 4¾¢
Half Jack.....₱ ℔ 4½¢
Cecilia.....₱ 100 ℔ $4.85
Choice Red.....₱ 100 ℔ 4.60
(*Spot Oil, ¼¢. ₱ ℔ higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....	₱ gal. 10@11¢
Kerosene.....	₱ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₱ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....70%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanized Iron Range Boilers, Extra Heavy, above 52 gallon.....65%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.

Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₱ ton.....$30.00@$35.00
Asphaltum, Rock, ₱ ton.....$14.00
Coal Tar Felt, 1 ply, ₱ ℔.....2¢
2 Ply Roofing, ₱ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₱ roll, 108 sq. ft.....1.35
Roofing Pitch, ₱ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₱ bbl.	$1.47@	$1.48
Rosin, E & F.....	₱ bbl.	1.52@	1.60
Rosin, G. & H.....	₱ bbl.	1.65@	1.70
Rosin, I. & K.....	₱ bbl.	1.80@	1.90
Rosin, M. & N.....	₱ bbl.	2.10@	2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₱ sqr.	$3.75@	$5.00
No. 1 Bangor Ribbon.....	3.35@	3.75
Pen Argyle, ₱ sqr.....	3.75@	4.35
Peach Bottom, ₱ sqr.....	4.75@	5.60
No. 1 Chapman, ₱ sqr....	3.80@	4.80
Lehigh Slates, ₱ sqr... ..	3.00@	4.50

Vermont:

Sea Green, ₱ sqr.....	$2.50@	$3.55
Purple, ₱ sqr.....	3.25@	4.00
Unfading Green, ₱ sqr...	3.75@	4.50
Red, ₱ sqr.....	9.00@	11.00

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔, ₱ ℔.....3½¢
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₱ ℔.....4¢
5% dis.

Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, ₱ ℔.....40¢

Soldering Coppers—

Per ℔.....15½¢@17½¢ net

Spelter—

Western Spelter.....4.45@4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₱ ℔.....15½¢
Straits, pigs, ℔ ℔.....14¾¢
Straits, in bars, ₱ ℔.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade, IC,		10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔	10¢
95 ℔	15
90 ℔	20¢
85 ℔	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating...	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating...	8.00 @ 9.25
STP Grade, 10 to 12 ℔ coating...	6.75 @ 7.50

Boiler Plates, American—

1XX, 14 x 26..(112 sheets).....$9.10
1XX, 14 x 28..(112 sheets).....9.80
1XX, 14 x 31..(112 sheets).....10.85

Tin Plates, Imported—

Duty, 1½¢ ₱ ℔.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke,	IC, 14 x 20.....	$4.25
	IX, 14 x 20.....	5.25

Terne Plates—

MF, IC, 14 x 20.....	$6.25
20 x 28.....	12.50
Worcester Grade, IC, 14 x 20.....	4.25
20 x 28.....	8.50
Dean Grade, IC, 14 x 20.....	4.00
20 x 28.....	8.00
Gilbertson's Old Method, IC, 14 x 20..	7.50
20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved pattern, ₱ doz...18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain.....72%
1¼ and less, Galv.....67%
1½ and larger, Plain.....78%
1½ and larger, Galv.....70%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
" 2½ inch and larger....75%

Zinc—

600 ℔ casks ₱ ℔ 5¾¢ | Per ℔.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son, Utica, N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.

Architectural Ornaments.
Art Metal Relief Co, Covington, Ky.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y
Dover Stamping Co., Boston, Mass.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M, Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Range.
Wolff, L. Mfg. Co., Chicago, Ill.

Books.
Tower, F. W., Springfield, Mass.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co. Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Art Metal Relief Co., Covington, Ky.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co, Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 2; Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. *(See Pipe Couplers.)*

Crimping Machines.
Packham Crimper Co., Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs. Rain Water.
Cooney, Seimer & Co., Indianapolis, Ind.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros., Phila., Pa.
Grecne, W. F., Troy, N. Y
Griswold Mfg. Co, Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers, L. M & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co, Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Enameling Ovens.
Blodgett, G. S. Co., Burlington, Vt.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Braud Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Pease, J. F., Fce Co., Syracuse, N. Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Hull, M. L., Cleveland, O.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Galvanizing.
Gregory, Thos. Galvanizing Works, Brooklyn, N. Y.

Gas Burners.
Zeck, W. R. & Co., Cincinnati, O.

Gas Heaters. *(See Stoves and Ranges, Gas.)*

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Grinding Mills.
Straub, A. W. & Co., Phila., Pa.

Gutter Formers.
Whelan, Dennis, J., Troy, N. Y.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Empire Heating Co., Easton, Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Magee Furnace Co., Boston, Mass.
Mitchell Heater Co., Poughkeepsie, N. Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fce Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
Kleckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Illinois Pure Aluminum Co., Lemont, Ill.

House Furnishing Supplies.
Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co., Boston, Mass.

Iron, Galvanized Sheet. *(See Sheets, Galvanized.)*

Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. *(See Sheets, Iron and Steel.)*

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lard Cans.
Kleckhefer Bros. Co., Milwaukee, Wis.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. *(See Ceilings, Metallic.)*

Mica.
Huse, Jos. & Son, Boston, Mass.
Munsell, Eugene & Co., 218 Water St., New York.

Nickel Plating Outfits.
Eddy Electric Mfg Co., Windsor, Conn.
Hanson & VanWinkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Oil Heaters. *(See Stoves and Ranges, Oil, Vapor and Gasoline.)*

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Patterns.
Bascom, H. Clay & Co., Troy, N. Y.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pig Tin.
Phelps, Dodge & Co., 11 Cliff St., N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Peck Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson, R. M., Rome, N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Pokers and Lifters.
Arcade Mfg. Co., Freeport, Ill.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
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Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
West Mfg. Co., Buffalo, N. Y.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam and Hot Water.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
Wheeler, E. S. & Co., New Haven, Ct.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Challenge Corn Planter Co., Grand Haven, Mich.
Eclipse Refrigerator Works, Burlington, Vt.
Gurney Refrigerator Co., Fond du Lac, Wis.
Monarch Refrigerator Works, Burlington, Vt.

Registers.
Berger Bros., Phila., Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Highton, Wm. & Sons, Boston, Mass.
Schreiber & Conchar Mfg. Co., Dubuque, Iowa.

Roasters and Bakers.
Hill-Whitney Aluminum Co., Boston, Mass.

Roofing, Asphalt.
Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Bowers, L. M. & Co, Binghamton, N. Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Ct

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.
Michigan College of Mines, Houghton, Mich.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co, Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Fladd Press Co., Watertown, N. Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
Universal Machine Co., Canton, Ohio.
West Mfg. Co., Buffalo, N. Y.
Whelan, Dennis J., Troy, N Y.

Sheet Metal Work.

Art Metal Relief Co., Covington, Ky.

Sheets, Iron and Steel.

Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Phelps, Dodge & Co., 11 Cliff St., N.Y.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.

Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.

Laiance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Slaters' Tools.

Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties Manufactured.

Burrows, F. S., 107 Beekman St., N. Y.

Specialties Sheet Metal.

Vogel, Wm. & Bros., Brooklyn, N. Y.

Stamped Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Statuary, Sheet Metal.

Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.

Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 19th St., N. Y.

Steel Stamps and Stencil Dies.

Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.

McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Newton & Co., Albany, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.

Bascom, H. Clay & Co., Troy, N. Y.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Braner, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.

Mersick, C. S. & Co., New Haven, Ct.

Stoves and Ranges.

Bergstrom Bros. & Co., Necnah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Bussey & McLeod Stove Co., Troy, N.Y.
Champion Steel Range Co., Cleveland, Ohio.
Eclipse Stove Co., Mansfield, O.
Girard Stove & Fdry. Co., Youngstown, Ohio.
Graff & Co., 208 Water St., N. Y.
Magee Furnace Co., Boston, Mass.
Michigan Stove Co., Chicago, Ill.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Sheppard, Isaac A. & Co., Phila., Pa.
Thatcher Furnace Co., 240 Water St., New York.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.

Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Tea Kettles.

Central Stamping Co., 23 to 25 Cliff St., New York.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.

Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. O. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate. (*Mfrs. of.*)

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Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

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Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

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Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.

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Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co., 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct.

Zinc, Sheet.

Phelps, Dodge & Co., 11 Cliff St., N. Y.

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THE METAL WORKER.

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A SALESMAN of ability and coanections in Eastern and Southern States to represent a well-known line of steel raages on commission. "Steel Ranges," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 25

RETINNER; ono who is practical in the latest improved way of retinning. P. O. Box 1778, Now York City. Dec. 25

A first-class STOVE SALESMAN for Western and Sonthern New York; give experience and salary expected. "Stoves," office of *The Metal Worker*, 232 238 William street, New York City. Deo. 25

A young man who has some knowledge of cornice cuttiag and drafting who waats to finish his trade in a good shop; state how long been at busiaess and what wagos wanted. "Cornice," office of *The Metal Worker*, 232-238 William street, Now York City. Dec 18

Oae first-class TINNER; one who can do all kinds of tin work, both inside aud outside work; must be strictly sober, steady aad reliable; will give the right maa steady employment. M. J. Williams, 315 Maia street, Baton Rongo, La. Dec 18.

SALESMAN New Engaad States to sell stoves, ranges and fnraaces; noae except experienced men who have traveled this territory and have some trade need apply; state experience, salary, age, &c. "N. E. S.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

Boy betweea 15 aad 18 years of age to learn plumbing and gas fitting, with or without board; must be quick, honest and obliging; to the right boy all opportunities will be offored to learn tho bnsiness, with other good prospects in future; give all particulars. "E. S.," office of *The Metal Worker*, 232-238 William street, Now York City. Dec. 18

TRAVELING SALESMAN familiar with Sonthera stove trade; must bo ycung, sober and engeretie; stato age, exporienco and references, also compeasatioa desired. "Steadfast," offico of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

Wonld like to correspoad with a good all aronnd TINSMITH immediately; oae who is used to all kinds of work doae in a country shop and stove store and general jobbing; no floaters need apply. Tuckerton Tin & Sheet Irou Works, Tuckerton, N. J. Doc. 18

A first-class TINNER; one with exporiouco on coffee ura work; nono other need apply. "E. L. B.," care Wrought Iron Range Company, St. Lonis, Mo. Dec. 18

SALESMAN for the West and South, acquainted with the iron and steel roofing bnsiness, tin plates, &c.; aame territory where last employed aad salary. "Roofiag Salesman," office of *The Metal Worker*, 512 Commercial Bnilding, St. Louis, Mo. Dec. 18

A TINNER aad PLUMBER, good on inside aad ontside work; a sober, steady man; must be a hustler; steady work to rigfit man. Weatherford, Thompson & Co., Chicago, Ohio. Dec. 18

SITUATIONS WANTED.

A bright, energetic man, who understands furaace, cornice and all kinds of sheet uetal pipe and stove work, is capable of cutting aad can detail work from plans, would like a steady position with somo roliable firm for the year 1898 in a good town or city; do not answer unless you aro in need of a good, steady and reliable workman; am single; can speak German, and have the best of references; wages moderate. "F. A. H.," otlice of *The Metal Worker*, 512 Commercial Building, St. Louis, Mo. Dec. 25

By a DESIGNER and MODELER for stove ornaments. "W. G.," ofiice of *The Metal Worker*, 232 238 William street, New York City. Dec. 25

A SALESMAN calling on the hardware, drug and grocery jobbing trade with a liae of oil caas in Eastern Pennsylvania, New Jersey, Eastern New York and the New England States, desires a line that can be worked in coaaection with the oil can. 401 Lippencott Building, Philadelphia, Pa. Doc. 25

By a first-class WOOD PATTERN MAKER who can do designiag, carving, tiaaing and all work in stove trade: 13 years' experience: 28 years of age: wages $3 per day. Geo. Gnenther, 66 Bertram street, Cleveland, Ohio. Dec. 25

I wish to secure after Jauuary 1 tho ageacy for New Orleaus and viciaity of a large and reliable wholesale house: I am well kuown to tho trade here through my present conaections and caa assure a thorough introductiou of the products of auy firm I may represent; correspondence solicited; references given. Frank Paul Barber, 530 Gravier street, New Orleans, La. Dec. 25

By a yonng man, three years at plnmbing; can do jobbing; would like a chance to improve; has some tools; refercnce. Edw. F. Walsh, 407 East Eighty-first street, New York City. Dec. 25

By a BOOKKEEPER aad SALESMAN with some house in New York; has had office experience in both the wholesale aud retail branches of tho steam and hot water heating, furnace, plumbing and tinning trades; thoroughly competent aad can give references; desire permanent position with a reliable firm. "Qnalified," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 25

Steady job the year round by a COPPERSMITH; experienced in different branches of the trade. L. Moe, 1516 Fourth street, West Superior, Wis. Dec. 25

A first-class PLUMBER, TIN and SHEET IRON WORKER and furnaceman would like to hear from parties desiring a steady, sober, reliable man who can bo depended upoa. "Plnmber aad Tinsmith," 3 West street, West Somerville, Mass. Dec. 25

As BOOKKEEPER or ASSISTANT, or as clerk in a hardware store; experienced; best of reference; steady job desirod with a chaace of advaacement. 723 Turin street, Rome, N. Y. Dec. 25

Steady job by a TINSMITH of ten years' exporience; 30 years of age; marriod; best of refereaces; good habits; moderato wages. E. B. Peck, York, N. Y. Doc. 25

BOOKKEEPER, CASHIER; age 32; married; refers to former employer, with whom he spent 15 years in position of trust and responsibility; fair salary. Wm. Sturz, 429 Pulaski street, Brooklya, N. Y. Dec. 25

By a yonng man who is a good hand at tinning, plumbing, roofing, spouting, stove aud heater work, electrical bells and bicycle repairing; 12 years' experienco; sober and steady. Jos. Brooks, 311 Franklin street, Bloomfield, N. J. Dec. 25

By practical TIN and SHEET IRON WORKER: thoroughly understands hot air heating; city or country; refcrence from last employer. Johu Cassidy, 105 Magazine street, Newark, N. J. Dec. 25

SALESMAN for stoves, furnaces, steam and hot water heaters is opon for position; thoroughly posted and energetic; referonces; New England territory preferred. "Heating," care Albany Hardwaro & Iron Company, Albauy, N. Y. Dec. 25

Position by a man of experionce in tin shop, machiae shop, milling shop aad blacksmith shop; temperate and caa furnish good referonces. "T. M. Shops," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 25

An experienced managiag SALESMAN, with first-class connections and acquaintaace amoag tho hardware and stove trado in New York City, Brooklyn and vicinity, is in a position to represeat manufacturers of all heatiag and cooking goods or hardware specialties to great advantage in the above territory; first-class references. "H. A.," office of *The Metal Worker*, 232-238 William street, Now York City. Dec. 25

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By a first-class CORNICE MAKER, all kinds of roofiug; would like steady work; city or country. T. Diamond, 1029 North Fourth street, Philadelphia, Pa. Dec. 18

As TRAVELING SALESMAN for the coming year with a tin plato or metal house by a practical job tinner; a Christian iaan who neither smokes nor drinks. Johu E. Whitbeck, Box 408, Phelps, N. Y. Dec. 18

As FOREMAN of a stove foundry by one who has had 20 years' experience, part of time interested; nnderstands it thoroughly in all the braaches, being a mixer and melter of iron; also a practical follow board and flask maker. "Foundry Foreman," office of *The Metal Worker*, 22-24 Pickery Building, Cincinnati, Ohio. Dec. 18

By an AI SALESMAN with some good house; long experienco in hardware, tin and stoves; can speak Germaa and English. "German," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

By a young man who has had 12 years' experience at TIN and SHEET IRON WORK; good furnace worker; all kinds of insido aud outside work; best of referonces; wages moderate. Thomas Wheeler, Beaver street, West Oraage, N. J. Dec. 18

As FOREMAN in stove pattern shop; drafting, designing and carving; best of refereaces. "H. X.," office of *The Metal Worker*, 232 238 William street, New York City Dec. 18

By a japanner, plain and ornamental, as FOREMAN; understands all braaches of the business; first-class references. M. T. Walker, Floyds Knobs, Ind. Dec. 18

First-class PLUMBER, with nine years' practical experieace, desires a steady positiou in any part of the United States; can furnish AI reference. James P. Goodsell. 185 West Sixty-third street, New York City Dec. 18

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By first-class stove SALESMAN, with 15 years' road experience in Ohio, Pennsylvania, New York and Eastern States; established trade. "Trade," offico of *The Metal Worker*, 232-238 William streot, New York City. Dec. 18

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BOOKKEEPER or STENOGRAPHER; seven years' experionce in mannfacturing busiuess; best of reference; bond if necessary. J. F. Copelaud, Box 256, Cambridge, City, Ind. Dec. 18

By a first-class PLUMBER and GAS FITTER; a good hand on tin and sheet iron work. John Abrams, Hempstead, N. Y. Dec. 18

By a young man with 24 years' experinece in the shop, in the store and on the road, as TRAVELING SALESMAN in North and South Carolina, Georgia and Florida with a first-class stove mannfacturor, tinware and house furnishing goods, or an importer of metals; well acquainted with tho trado in those States; best reference from present or former employers. "T. E. H.," offico of *The Metal Worker*, 232-238 William street, New York City. Dec. 18

As an EXPERT on defective ranges and furnaces. "F. D.," office of *The Metal Worker*, 232-238 William street, New Yrok City. Dec. 11

A TRAVELING SALESMAN with established trade in Maine, Now Hampshire and Vermont would like position with some large concern not represented there in the kitchen furaishing line. "W. R.," office of *The Metal Worker*, 70 Kilby streot, Boston, Mass. Doc. 11

By a first-class STOVE MOUNTER and FILER; experieucod on repairs; references given. "Mounter," offico of *The Metal Worker*, 232-238 William streot, New York City. Dec. 11

A steady posltion by a PLUMBER, GAS aud STEAM FITTER; 30 years' experience in city and country; can take charge and estimato from plans; perfectly steady; references from past employers. "Industry," No. 1211, office of *The Metal Worker*, 232-238 William street, New York City. Dec. 11

By a good boy williug to work; can do tin and slate roofing, cornico and skylight work; can work from plans; references; wages $9 per week. John G. Woraor, care Mrs Bellion Van Nest, Victor stroot, Westchester, NowYork. Dec. 11

By a SOLDERER with over ten years' exporiencc; handy around machinery; wages $6 a week. "Martin," caro J. R. Brown, 72 Prince street, Brooklyn, N. Y. Dec. 11

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A good ten room frame house with Tin Shop on end of lot. A splendid place for a tinner. Employment in resper factory, employing 1000 men, nine months, other three months job work. House well arranged for business, boarding or rooming. Large factories close. Lot 20 x 200. Will sell cheap for cash.

Write

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Active, progressive American, 41, with 20 years' experience as a local and traveling salesman and sales agent of a corporation in this city, whose business is with stove manufacturers, jobbers and retailers of stoves, hardware, tin and plumbing goods; large acquaintance with buyers East of Chicago and Pittsburgh; thoroughly conversant with modern business methods, management of salesmen, &c., in every way capable of filling responsible position, is open for an engagement here or elsewhere, in which this experience can be utilized; clean record; high credentials Address "A. B. C.," office of *The Metal Worker*, 232-238 William St., New York.

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Old established Tin and Sheet Iron Business, doing a good trade in Stoves, Ranges, Heaters, etc., also a 2½ story brick factory complete with tools and implements for the manufacturing of Tin and Sheet Iron specialties, to be sold entirely or in part, whichever is desirable. A good opportunity for a live business man.

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Stove and Steel Range Manufactory

Located at MUNCIE, IND.,

To be Sold at Public Sale.

The stockholders of the JOSEPH BELL STOVE & RANGE COMPANY have passed an order to sell their plant and equipment and stocks of material and manufactured stock at public sale, on Wednesday, the 5th of January, 1898, on the grounds of the company at MUNCIE, IND.

The property consists of over 6 acres of ground conveniently situated at MUNCIE, IND., on the West Bank of White River, on the line of the Lake Erie & Western Railroad and accessible to the Big Four Road. The buildings thereon are nearly new and of substantial construction. The Molding building, of brick, is 135 by 145 feet There are two cupolas. The Mounting and Storage building, also of brick, is two stories high, 260 by 60 feet. Office building and show room of frame, two stories. All of the best construction and conveniently arranged.

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A gas well on the premises belonging to the company furnishes an abundant supply of natural gas. These works have been in operation until recently and are in order to resume work at any time.

The entire property, including all stock on hand at day of sale, materials, patterns, tools and equipment and good will, will be sold in one lot. Sale to take place on the grounds of the company, at MUNCIE, IND., on Wednesday, the 5th January, 1898.

The terms will be made accommodating. Persons desiring information will please address the undersigned,

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Stoves, Tinware, Heating and Plumbing. Live manufacturing town Northern Massachusetts. Sales $16,000 to $18,000 a year. Fine Trade. Well established. Partner wishing to retire, must be sold by January 1. Best chance in New England to make a dollar.

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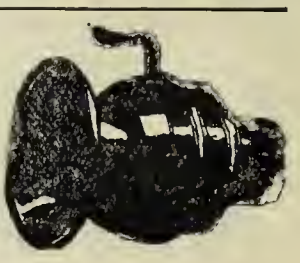

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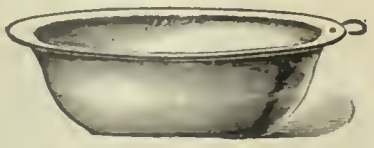

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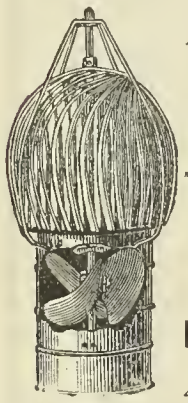

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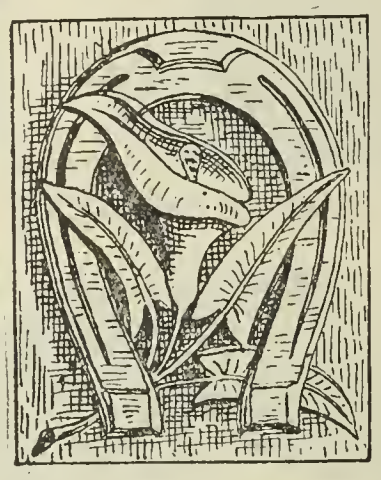

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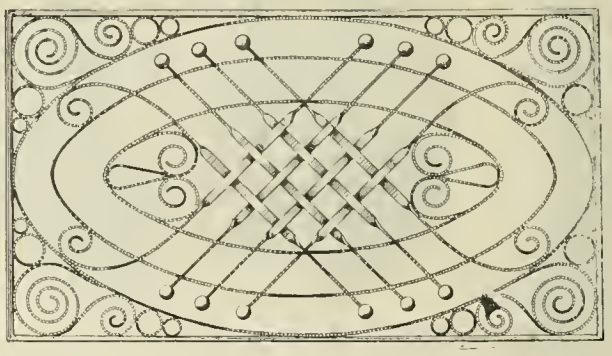

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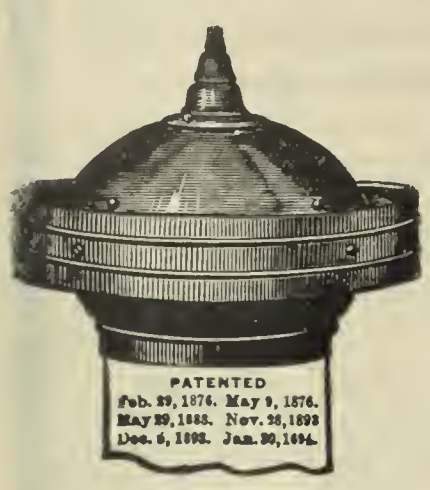

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Smoky Chimneys Cured. Send for Model and Pamphlet.

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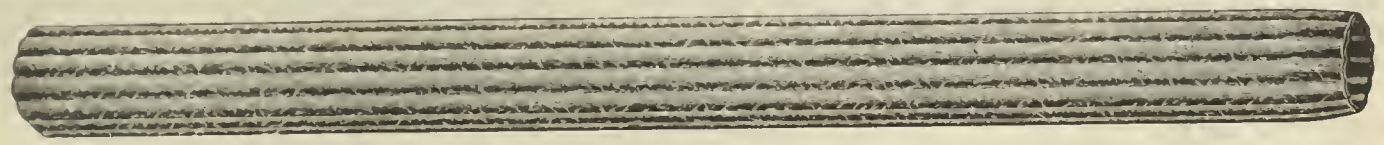

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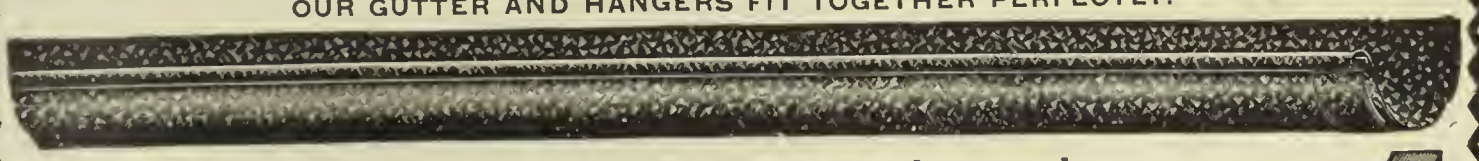
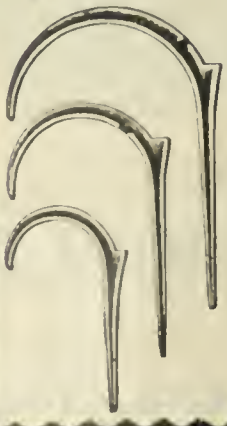
OUR GUTTER AND HANGERS FIT TOGETHER PERFECTLY.



Berger's Patent

Standing Seam and Slate Roof } Snow Shoe Irons.



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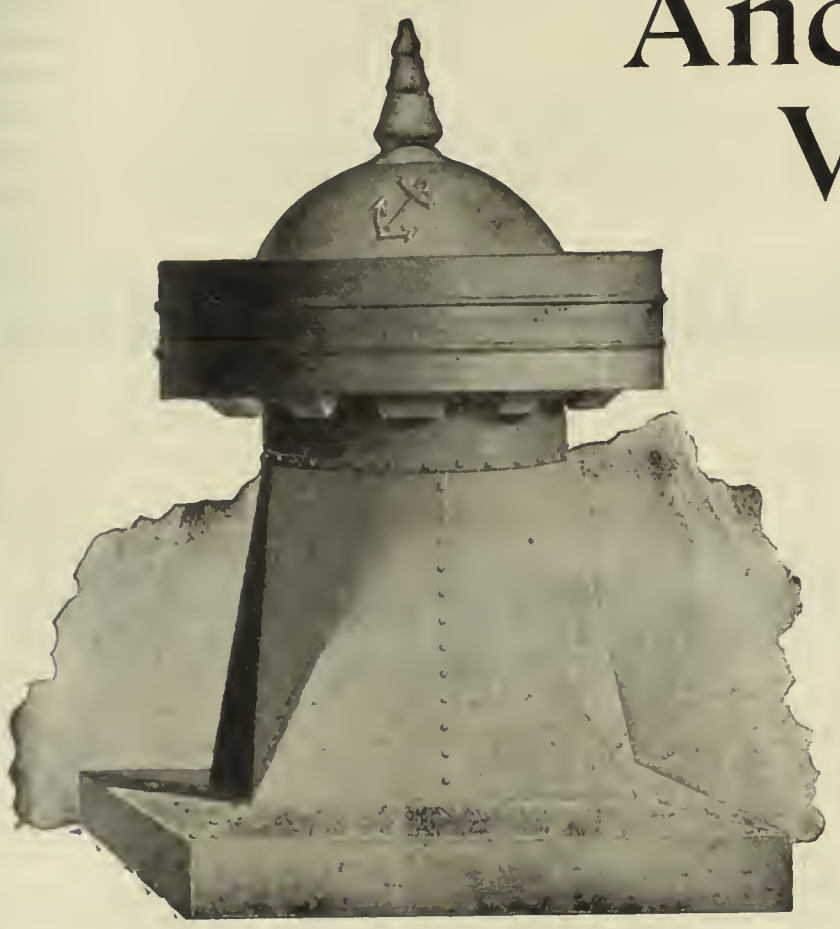

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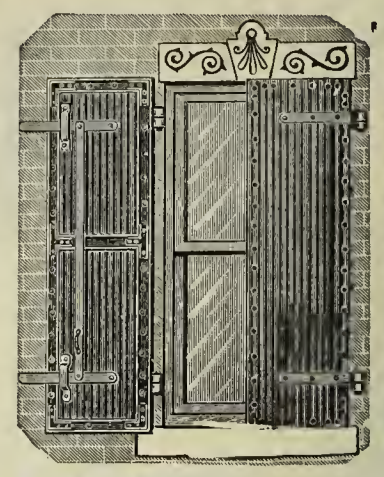

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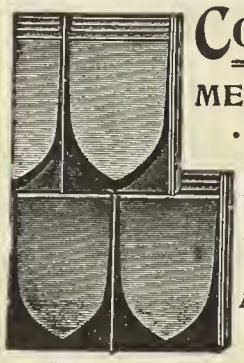

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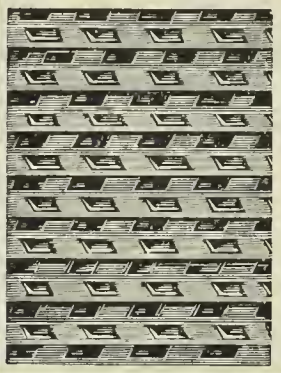

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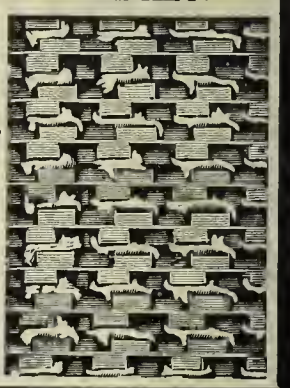

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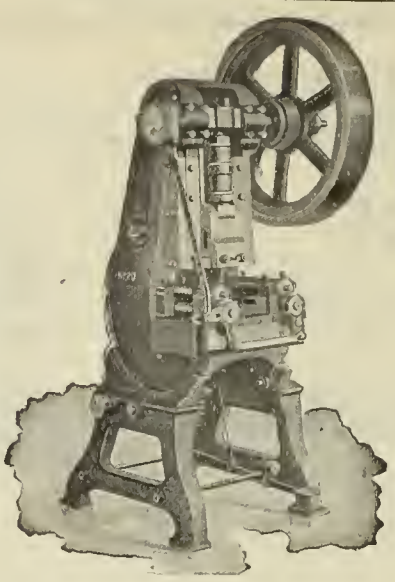

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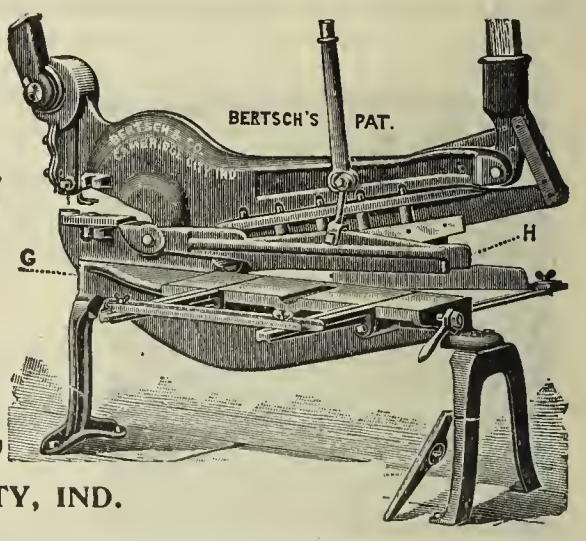

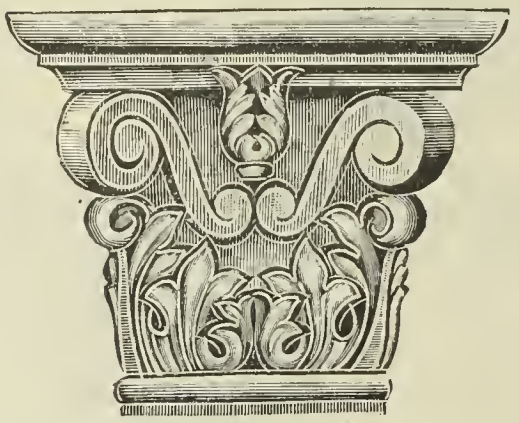

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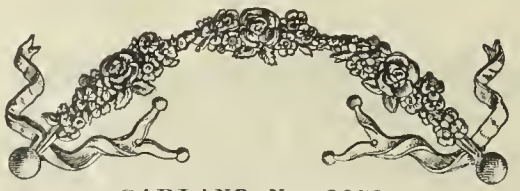

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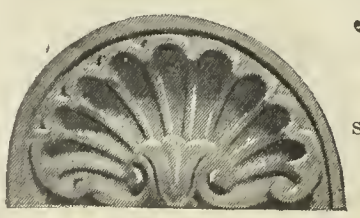

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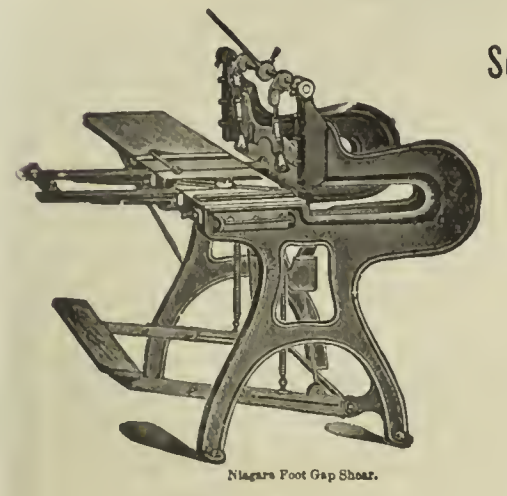

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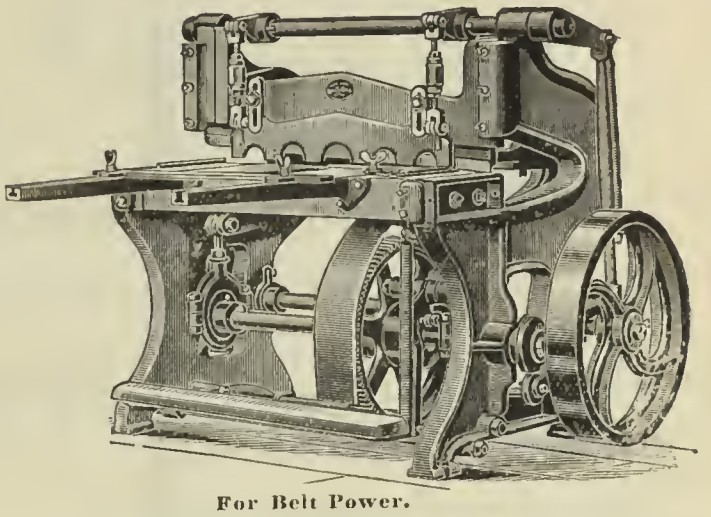

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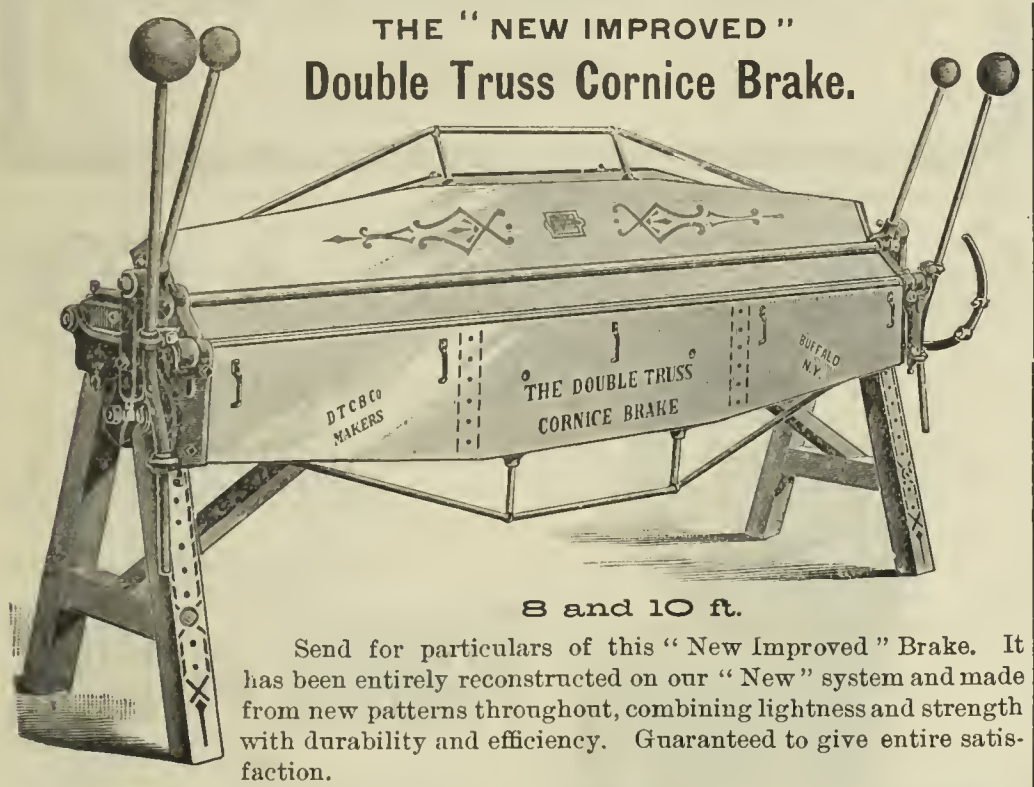

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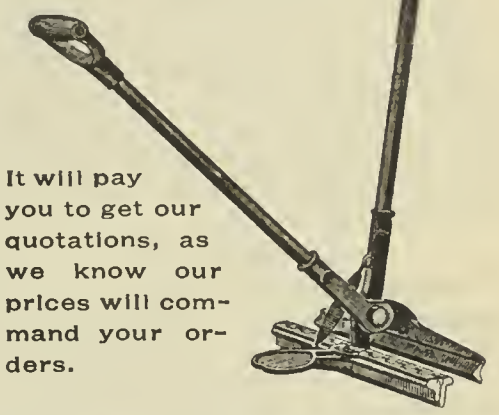

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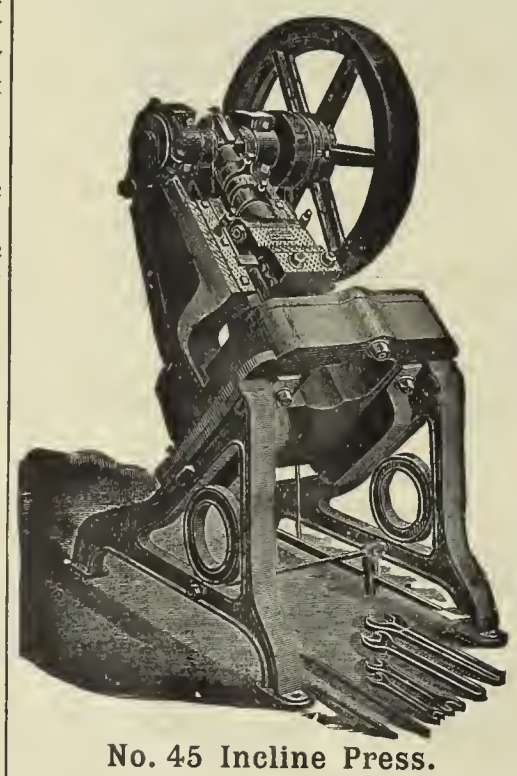

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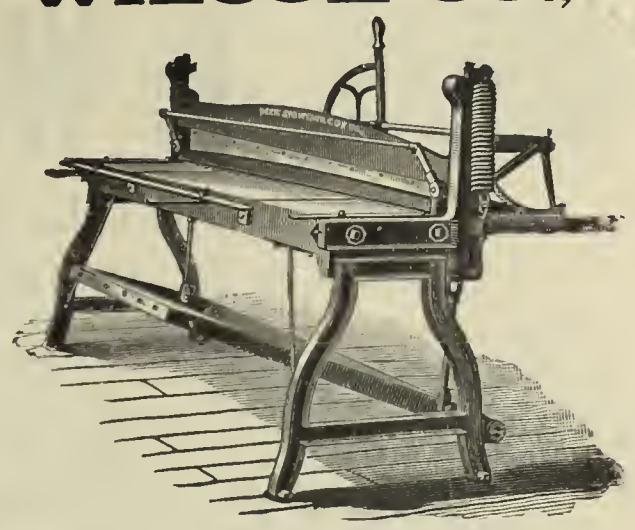

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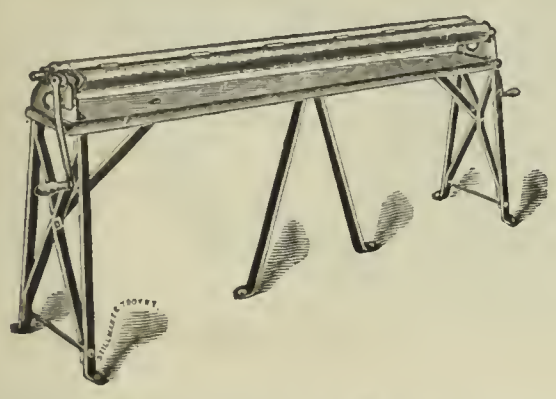

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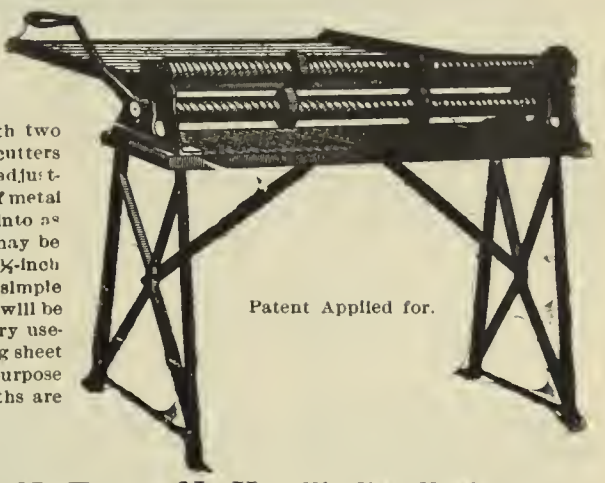

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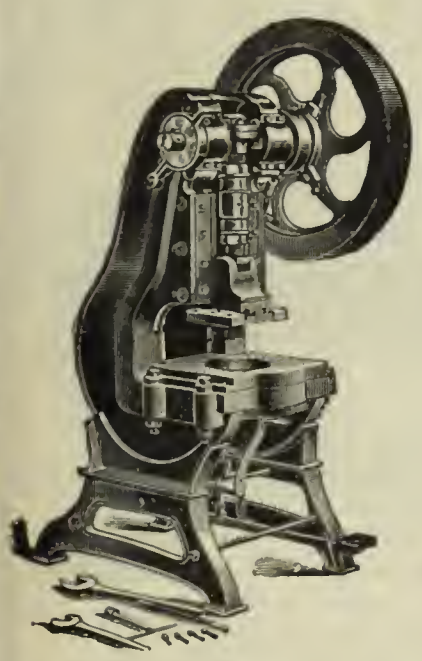

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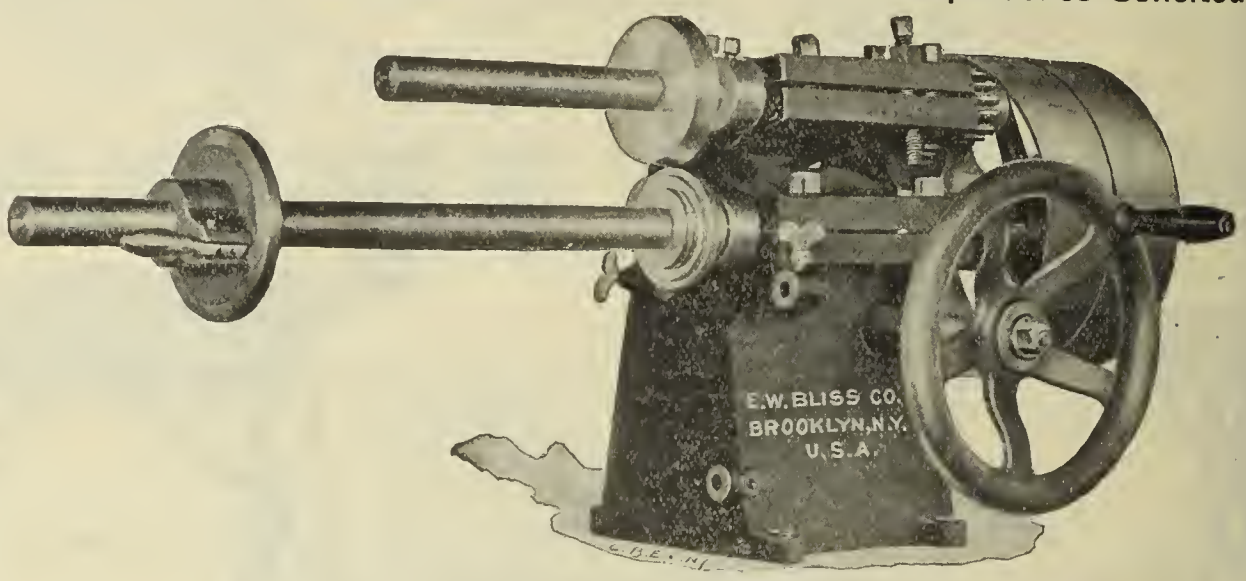

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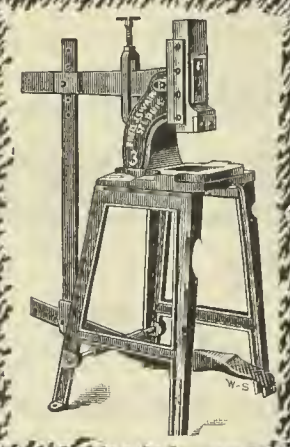
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—MADE HIM TIRED—Wheeler—I have made eight century runs this season already. What do you think of that?

Walker—It would have been better if you had made them all in a row in one direction.—*Indianapolis Journal.*

—ACCORDING to the Indianapolis *Journal*, a neighbor said to an old farmer recently: "You do not regret the money you expended on your son's education, do you?"

"I guess not," replied the old fellow, with animation. "He learned me a lot of uppercuts, short-arm jabs and things that has made me the best man in the county."

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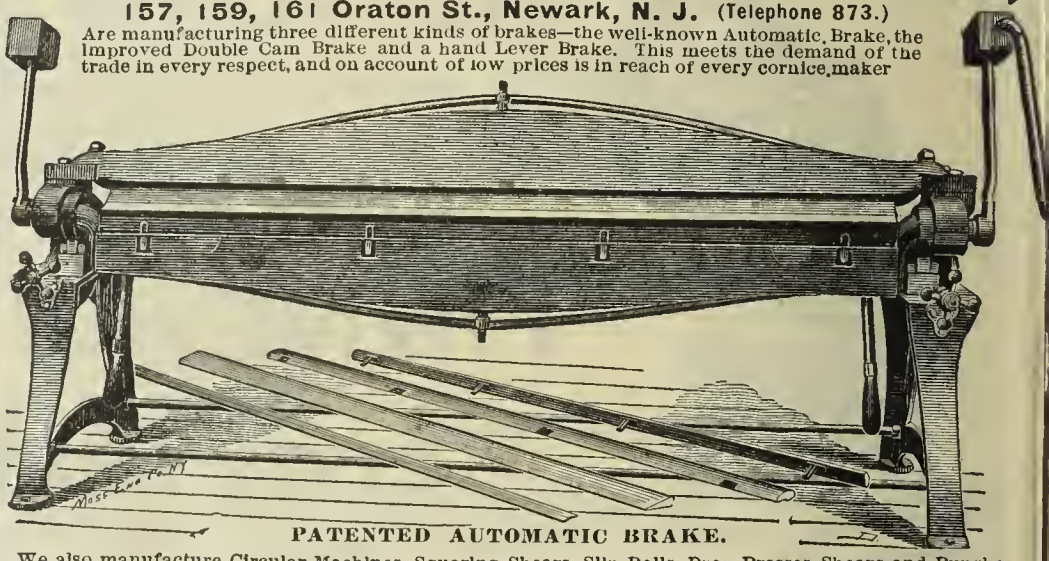

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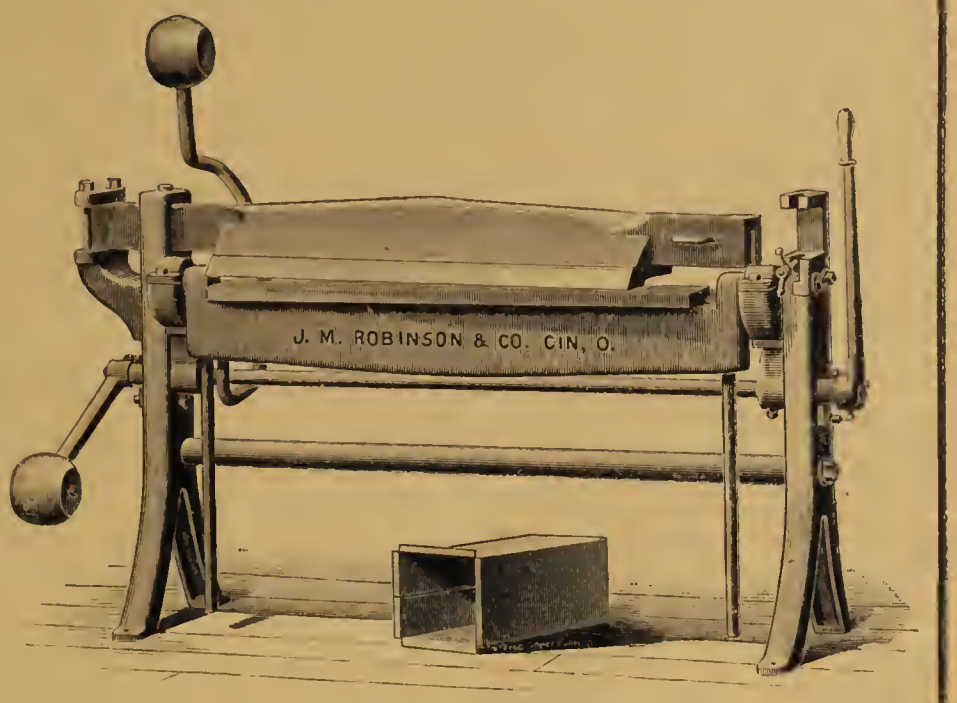

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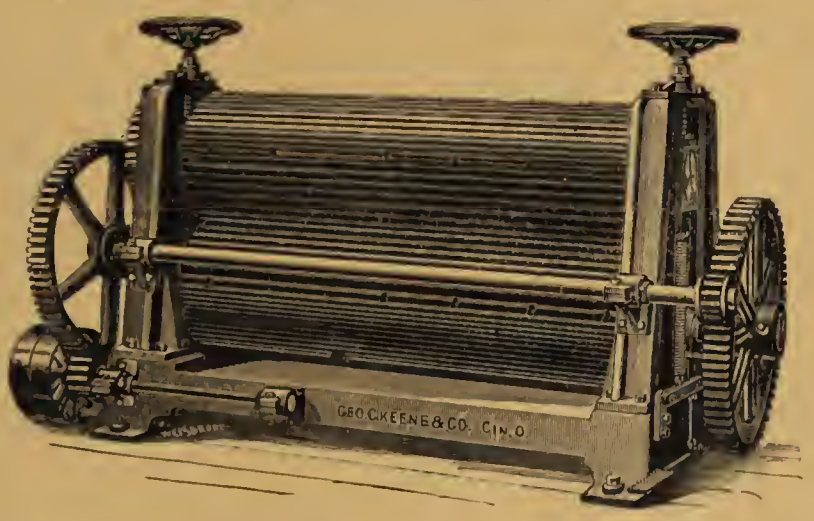

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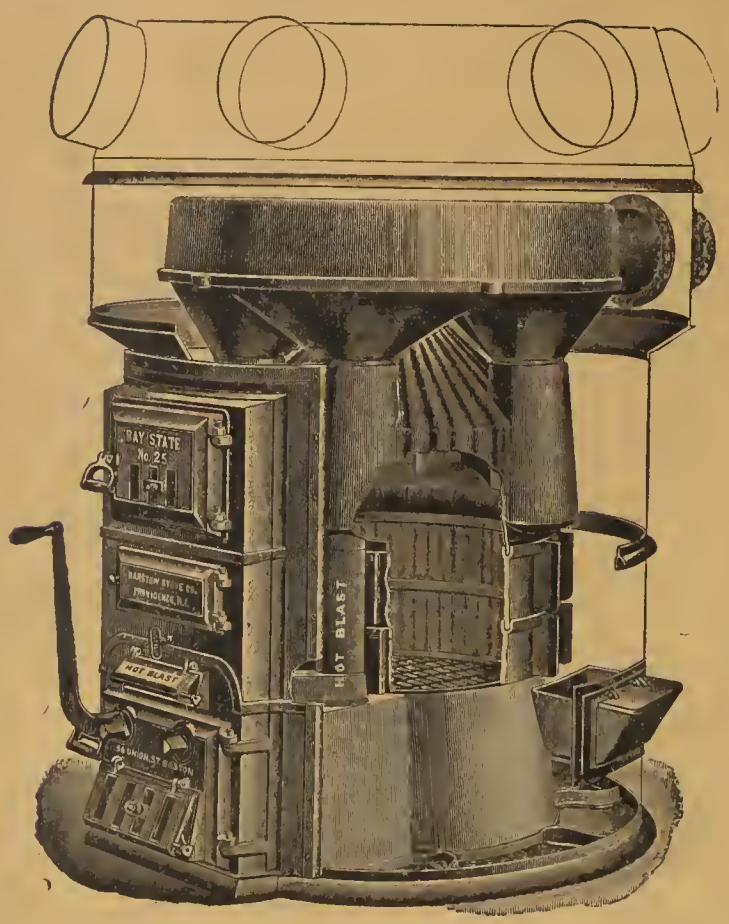

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